LWG
LOWER WILLAMETTE GROUP

EPA Region 10 Superfund
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MEMORANDUM

RECEIVED
JUL 21 2003
Environmental Cleanup Office

Date: July 17, 2003

To: Chip Humphrey; Tara Martich; Lori Cora, U.S. Environmental Protection Agency

From: Bob Wyatt, NW Natural Gas; Jim McKenna, Port of Portland
Lower Willamette Group Co-Chairs

Re: Potential Responsible Party Pursuit Strategy [redacted]

INITIAL APPROACH TO PRP PURSUIT

This memorandum addresses the LWG's proposed PRP pursuit strategy to support its goal of an expedited, focused RIFS and ROD by 2006. The strategy has two primary objectives: First, to find additional PRPs with the necessary resources to pay for the investigation of the Harbor. Second, to identify and ferret out the PRPs necessary to implement any remedies that will be selected at the end of the current process. This memorandum focuses on the first element of the proposed overall PRP strategy.

LWG's Retention of Neutral Investigator. The LWG has retained the services of Bill Hengemihle and LECG to assist it in initiating the long-term phase of the Group's PRP pursuit strategy. LWG desires to work with EPA to have fact finding conducted to identify PRPs, bring them to the negotiation table, and to assure a fair and comprehensive allocation process relating to responsibility for implementing the Harbor ROD. LECG will assist the Group in developing a PRP pursuit path, in consultation with EPA, to ensure that a critical mass of PRPs is available to implement the ultimate harbor-wide ROD.

Short-Term Priorities. In addition, in the short-term, LECG will assist the LWG by inviting currently non-cooperating PRPs to cooperate with EPA and the LWG by stepping forward jointly to fund the current harbor-wide RIFS. Over the next several months, the LWG desires to work with EPA to identify and seek the cooperation of financially viable entities that, based on available information, cannot be classified as *de minimis* PRPs and who collectively represent a "manageable number of parties" within the meaning of EPA's enforcement policies for multi-party sites.[1] LWG would like to foster a graduated approach from negotiation and consent to EPA enforcement (if necessary) consistent with the goals of CERCLA and applicable EPA policy.

Action Plan. Using LECG, the LWG would screen the PRPs who have been identified by various parties as responsible for Harbor response costs and develop a list of known financially viable PRPs that cannot at this time be classified as *de minimis* based on any reasonable or objective basis. LWG would share the list of PRPs and the results of its screening with EPA. LWG would then assemble and review available information about

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1 See, e.g., Documentation of Reason(s) for Not Issuing CERCLA § 106 UAOs to All Identified PRPs, EPA Office of Enforcement and Compliance Assurance (Aug. 2, 1996) ("1996 UAO Policy")

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the selected subset of PRPs to fill out the attached "PRP Information Summary." Attachment A. The form can be adapted as EPA sees fit.

Three completed example PRP Information Summaries are attached in Attachment B for EPA's consideration. These examples - Shaver Transportation, Mar Com and Atlantic Richfield - represent a range of situations in the Harbor, each reflecting a slightly different factual basis for the necessary "nexus" to environmental conditions in the Harbor for both PRP designation and enforcement, if warranted.

Contingencies for Recalcitrance. Consistent with EPA's desire to have things done by consent rather than enforcement, the LWG will contact the selected PRPs (initially, through LECG) and seek to have them voluntarily enter into orders - as OSM did - or otherwise join the LWG in a manner that enables their cooperation and coordination in the harbor-wide RIFS under the same terms available to existing LWG members. The LWG believes the participation terms to be offered to non-member PRPs are consistent with approaches successfully used to attract broad PRP participation at other multi-party sediment sites in Region 10. Such terms will be shared with EPA.

Consistent with EPA's policy focus on enforcement rather than Fund-financed activities ("Enforcement First"), fair and consistent enforcement (1996 UAO Policy), maximization of PRP participation (draft Five-year Strategic Plan (see article, Attachment C)), and "polluter pays," LWG will ask EPA to pursue enforcement against any of the screened PRPs who fail to step forward to participate in the RIFS. The LWG understands that consistent with EPA policy, EPA's approach would likely be a sequenced one of letter notice, negotiation, but if appropriate and necessary, issuance of unilateral administrative orders.

The LWG believes that after a reasonable period for negotiated consent, EPA should pursue orders against screened PRPs who have not demonstrated reasonable cause for their non-cooperation. The desired approach in such circumstances is for EPA to issue unilateral administrative orders for coordination and cooperation in the harbor-wide RIFS. This approach is modeled on and consistent with the remedial action approach used by EPA Region 3 and upheld by the Third Circuit Court of Appeals in United States v. Occidental Chemical Company, 200 F.3d 143 (3d Cir. 1999) (Attachment D). Attached as Attachment D are some possible order terms and conditions that EPA might consider using in any enforcement order.

Conclusion. The LWG is committed to furnishing the resources to make this first phase of the Harbor PRP pursuit strategy a success. We would appreciate the opportunity to discuss this proposed approach with EPA.

cc: Lower Willamette Group Executive Committee

SUMMARY

1.0 LOCAL PRP CONTACT INFO

1.1 CORPORATE SERVICE INFO

2.0 SITE(S)

[Include information on: location relative to river (what side, RM); acreage; topography; pavement, storage tanks, drainage, other info relevant to pathways, surrounding land use type (e.g., mixed use, industrial, etc.)]

3.0 OWNER/OCCUPANT ACTIVITIES

Owner/Occupant	Type of Operation	Years

4.0 Current Site Use

[Include products and chemical handling]

5.0 Historical Site Use

6.0 Regulatory Cleanup History

7.0 History of Participation in the Harbor

8.0 Chemicals of Possible Potential Concern

9.0 Potential Pathways to Willamette River

[List all]

10.0 Release Events Known to Regulatory Agencies

[list highlights and summarize: spills and releases, tank removals, soil results, stormwater contaminants and flow, groundwater problems]

11.0 Summary of Existing Sediment Chemistry Within, Adjacent to, and Downstream of the Site

[include sampling results for CERCLA-defined hazardous substances found on submerged/submersible lands at the Site(s) that lie within the NPL Site. Attach one representative copy of sampling results (e.g., figure, table, etc.)as Exhibit 1]

Sources of Information

[e.g.: government agency files, public records, links to webpages etc.]

PRP Information Summary for Shaver Transportation Company

SUMMARY

Shaver Transportation Company is the former operator of a waste disposal facility historically located at what is now the Oregon Steel Mills property at approximately river mile 2, from which releases of hazardous substances to the Willamette River have occurred. Shaver is also the current owner and operator of a land parcel and wharf at approximately river mile 8 (see Figure 1) along NW Front Avenue. Both of these locations are within and adjacent to the area of the Portland Harbor Superfund Site currently under an RIFS. There is and has been a release of CERCLA hazardous substances from both locations. In addition, Shaver has for decades performed fuel lightering and waste transportation and disposal services at locations throughout the Superfund Site, typically in connection with Shaver's operations at the NW Front Avenue property and the former disposal facility.

1.0 LOCAL PRP CONTACT INFO

Shaver Transportation Company (ECSI #2377)
4900 NW Front Avenue
Portland, Oregon 97210

1.1 CORPORATE SERVICE INFO

Same as above.

2.0 SITE(S)

2.1 Rivergate Oil Sump

Location and Area. Shaver is connected with the Oregon Steel Mills (OSM) property, which is an approximately 145-acre property located on the east bank of the Willamette River (at approximately river mile 2) in the Rivergate area of Portland at 14400 N. Rivergate Boulevard (see Figure 2b). Shaver historically operated a sump in the southwestern portion of the OSM property (adjacent to the Willamette River) for the purpose of disposal of bilge water, waste oils and other marine wastes (herein the "Rivergate Oil Sump").

Topography. The topography of the OSM property is relatively level with elevations between 30 and 35 feet above the NGVD. The location of the Rivergate Oil Sump is approximately 20 feet above the NGVD.

2.2 NW Front Avenue

Location and Area. Shaver's NW Front Avenue site is located on the west bank of the Willamette River, at approximately river mile 8 (see Figure 1). The site consists of one tax lot totaling approximately 5.17 acres, comprised of 1.78 acres of uplands above the Willamette River, and 3.39 acres of lowlands on the river with dock facilities (see Figure 2a). Site features include a main office building, a storage shed, one 30,000-gallon diesel aboveground storage tank (AST), and three docks (see Figure 2). A septic tank is located in the central portion of the site, and an outfall located along or near the western property boundary. City of Portland Outfall #19 discharges northwest of Shaver's docks.

Topography. The topography of the NW Front Avenue site is relatively level in the upper parking area, but begins to slop towards the river starting at the office building and the AST. Elevations at the NW Front Avenue site range from approximately 10 to 30 feet above the National Geodetic Vertical Datum (NGVD). The majority of the site is paved or covered with structures. Areas near the fence line and AST are covered by grass and landscaping features.

3.0 OWNER/OCCUPANT ACTIVITIES

NW Front Avenue Site

Owner/Occupant	Type of Operation	Years
Shaver Transportation Co.	General Towing and Lightering	1958-Present
General Construction Co.	Unknown	Prior to 1958

4.0 Current Site Use

NW Front Avenue Site. Shaver operates a general towing and lightering service in the Portland Harbor. Shaver has maintained a business presence on NW Front Avenue since 1935, when they transferred their operations from St. Johns and the east bank of the Willamette River. They moved to their current location in 1958.

Shaver operates a fleet of 11 tugboats and 16 grain barges that are docked and periodically serviced at the site. River activities include oil change service using the shop barge, which receives used oil from, and distributes new oil to the ship being serviced. Used and new oil is transferred dockside directly between service trucks and the shop barge.

During routine oil changes, approximately 150 gallons is pumped from the ship being serviced to the Shaver Transportation vessel. Based on information provided by Shaver Transportation, 2,400 gallons of used oil is transported from the site by Harbor Oil each month (28,800 gallons annually). This implies that an equal amount of new oil is transferred between vessels. Shaver Transportation further indicated that approximately 50 gallons of TARR Solvent 365 is used annually for parts cleaning, and about 15 to 20 gallons of spent solvent is incinerated annually in the shop boiler for heating. The constituents of this particular solvent are unknown.

During Shaver's ownership of the NW Front Avenue site, various small quantities of lubricating oils, greases, paints, and solvents have been stored and used at the site. Currently, 15 to 20 55-gallon barrels of lubricating oils are stored in the drum storage area. In addition, approximately 100 gallons of paint are used at the site each year. Prior to 1996, the paint was stored in a storage locker in the headquarters building, but now all paint is stored on each tugboat.

5.0 Historical Site Use

NW Front Avenue Site. Prior to 1958, the NW Front Avenue site was owned and operated by General Construction Company. In 1958, Shaver Transportation relocated their company headquarters to the site.

The NW Front Avenue site has been used for Shaver's freight transportation business since that time, primarily as a moorage and maintenance depot for Shaver vessels. Shaver tugboats have been used for vessel assist, log raft towing and barge towing. Shaver Transportation Company became one of the most prominent towing and lightering operators in Portland Harbor during the Depression, with the acquisition of boats from smaller firms like Willamette & Columbia River Towing Company and Kenwood Lumber Company. Shaver Transportation assumed 50 percent ownership of Willamette & Columbia River Towing Company in that era, and they absorbed the Smith Transportation Co. in 1935.

Until 2000, the NW Front Avenue site utilized a septic system. The septic system consisted of a 1,000-gallon cylinder tank that was connected to a single drain line. In October 2000, the site was connected to the City's municipal sewer system.

5.1 Historical Harbor Activities

Shaver was founded in Portland in 1880. Shaver was one of the first local companies to use internal combustion engines on their vessels, bringing out their first, the Echo, in 1910. The Echo was upgraded to a diesel engine in 1922, making it the first towboat on the Willamette River that was fully diesel operated. Shaver had an enhanced role in the Portland Harbor during World War II. Their enlarged fleet of boats put them in a position to capture all of the tug assists of wartime shipyard launchings in Portland and Vancouver.

In late 1943 and early 1944, the Rivergate Oil Sump and pipe line was constructed by Poole, McGonigle and Jennings for the War Shipping Administration (WSA) to use as a disposal area in the Harbor-wide naval operations that were ongoing during World War II. The oil sump, also known as the bilge water pond, was located near the former Ramsey Lake, at the present-day OSM facility in the Rivergate Industrial District (this area was also referred to as the Portland Peninsula). Around the time the sump was constructed, Shaver purchased two barges from the Diamond O Transportation Company—the Oneonta and the Occident. The Oneonta (also referred to as ST-22) was a wooden oil barge that was converted to a sludge barge for servicing ships in the Portland Harbor, and in conjunction with the U.S. Navy sludge barge YSR-26, collected oily bilge water from berthed ships. The recovered sludge, or slop, was barged from the discharging vessel to Shaver's dock, where it was held until the Oneonta could be towed to the Rivergate Oil Sump and pumped out.

The Oneonta sludge barge serviced ships berthed at and associated facilities at area shipyards, shipping terminals and oil company docks (e.g., Oregon Shipbuilding Corporation, Kaiser-Swan Island, St. Johns and Swan Island dry docks, Terminals T-1, T-2 and T-4, and Richfield, Associated). Shaver's sludge barge also assisted ship repair contractors such as Albina Engine & Machine Works, Floating Marine Ways, Northwest Marine Iron Works and Willamette Iron & Steel Co. Ship scrappers such as Commercial Iron Works, Consolidated Builders, and Zidell also used the waste disposal services provided by Shaver.

After the conclusion of World War II, the WSA abandoned operations at the Rivergate Oil Sump and Shaver took over operations pursuant to a June 1, 1946 agreement with the Port of Portland. Through that agreement, Shaver assumed responsibility for maintaining the sump, sump dikes, the pipeline and offloading area and for burning floating product off the sump. In addition to operating the oil sump, Shaver Transportation continued to operate the Oneonta for use in the

Harbor for transporting waste materials to the sump for disposal. After Shaver took over the facility, they became the only sludge handler in Portland Harbor.

Records indicate that Shaver serviced ships and towed the Oneonta to the Shaver moorage or the Rivergate Oil Sump on 273 separate occasions between 1947 and 1959. Documents also associate Shaver with towing other sludge barges, specifically the BK Barge and the WT-114 barge, and pumping out more than one barge at the oil sump on separate occasions. The Oneonta was repaired and re-caulked at Shaver's NW Front Street facility.

During their tenure at the Rivergate Oil Sump, Shaver Company was charged with maintaining the sump dikes, providing use of the facility to all vessels and ship repair contractors and periodically burning the pooled floating wastes. Releases of wastes from the sump to the Willamette River are known to have occurred. For example, in May 1953, following heavy winter rains, the sump was overfilled, with a resultant dike breach. Escaping wastes flowed into the Willamette River and onto the neighboring Ledbetter Estate. Straw was used to contain the spilled wastes and as a burning agent (along with tires and gasoline).

Shaver towed bilge wastes in the Oneonta until at least 1959, at which time Shaver was looking at ways to recover oil placed in the sump while preparing for sump close-out. George Shaver, of Shaver Transportation, chaired a committee (composed of representatives from the ship repair and ship scrapping firms) that was charged with investigating a solution to the ongoing problem of Harbor oil waste disposal. The Rivergate Oil Sump finally closed to receipt of waste oil and the facility was demolished by late 1959 or early 1960.

Finally, throughout Shaver's long history in the Harbor, Shaver has provided extensive barge services for lightering petroleum fuels to vessels docked in the Portland Harbor. Shaver barges Occident and ST-20 were oil barges, dedicated to the delivery of No. 6 fuel oil (Bunker C) for refueling ships at berth.

6.0 Regulatory Cleanup History

6.1 Rivergate Oil Sump

In 1999, DEQ recommended a high-priority Remedial Investigation to evaluate sediment contamination at the OSM site. Results of an initial Pre-RI submitted to DEQ in February 2001 confirmed the presence of the former oil sump (or bilge waste pond) in the southwestern portion of the site. A second phase of Pre-RI field work was completed in the fall of 2001. Sediment, soil, and groundwater data in the Final Pre-RI Summary Report (XPA equivalent, January 2002), indicate the presence of hazardous substances at the OSM site that require further investigation. A Pre-RI Assessment Report was submitted to DEQ in 2002. OSM submitted an RI Proposal and RI Work Plan in the Spring and Summer of 2002. The RI will evaluate the site in three phases. Field work for phase I was completed in the fall of 2002.

6.2 NW Front Avenue Site

Based on initial sampling results from a river sediment quality study, DEQ identified the Shaver NW Front Avenue site as a potential source of contamination to the Portland Harbor. A Site Assessment Review Notice was issued to Shaver Transportation on March 3, 1999. A response from Shaver Transportation was received April 15, 1999. A site screening is scheduled (with level II priority). A Strategy Recommendation was completed by the DEQ on November 11,

1999. An Expanded Preliminary Assessment (XPA) to include sediment sampling and an evaluation of operational history to determine if the site has contributed to metals contamination in adjacent sediment was recommended. A Preliminary Assessment was submitted to the DEQ in

January 2002. DEQ issued an NFA for the upland site in June 2003. In-water sediment impacts from this site are being evaluated under the harbor-wide RIFS.

7.0 History of Participation in the Harbor

Shaver was initially identified by EPA as a potentially responsible party in a General Notice letter dated December 5, 2000 for their NW Front Avenue facility. More recently, since the time EPA's General Notice letter was issued, Shaver has been identified to DEQ and EPA as a responsible party for the operation of the Rivergate Oil Sump. Shaver participated in PRP group formation meetings in 2001. Shaver is not participating in the Lower Willamette Group.

8.0 Chemicals of Potential Concern

8.1 Rivergate Oil Sump

The primary chemicals of possible concern at the OSM site include petroleum hydrocarbons, PAHs, PCBs, and metals. Gasoline associated compounds (principally benzene, toluene, ethylbenzene, and xylenes (BTEX)) have been identified at localized areas with limited extent in the upland portion of the site. Groundwater contaminants include TPH, BTEX, semi-volatile organic compounds (SVOCs), and metals.

8.2 NW Front Avenue Site

Elevated metals have been found in adjacent sediments, including mercury, zinc, cadmium, copper, and lead.

8.3 Portland Harbor

PAHs released directly to the river due to extensive over-water activities.

9.0 Potential Pathways to Willamette River

9.1 Rivergate Oil Sump

Direct discharges of bilge, waste oil and other marine wastes from surface releases and groundwater transport appear to be the principal pathways to the Willamette River for sediment contaminants. Currently, stormwater runoff and shallow groundwater discharge are the primary contaminant migration pathways of interest. The remedial investigation work in progress at the site indicates that dissolved-phase TPH in shallow groundwater is present along a portion of the site generally down-gradient from the former oil sump, and this groundwater ultimately discharges to the Willamette River in this area.

9.2 NW Front Avenue Site

Over-water activities and direct discharges (oil transfer operations) appear to be the principal pathways from the NW Front Avenue site to the Willamette River.

9.3 Portland Harbor

Over-water activities and direct discharges are the principal pathways to the Willamette River from waste and fuel transportation activities.

10.0 Release Events Known to Regulatory Agencies

10.1 Rivergate Oil Sump

Typical types of releases at the oil sump facility included spillage to the river when pumping bilge water off vessels to the ponds; spillage to the upland when the pipe line leaked while pumping bilge water from the vessels to the pond; dike breaches when pond was overfilled, releasing oily waste onto upland and river; burning of the oil on top the pond, releasing thick black smoke billows; and seepage of bilge wastes from the unlined pond to soils and groundwater.

During the time period from 1946 to approximately 1959, when Shaver's operations at the facility wound down, there are several recorded observations of the pipe line leaking and spills occurring while off-loading the sump barge and other vessels, releasing oily waste to the river and upland property. For example, in May 1953, Shaver overfilled the sump, causing an overflow and a subsequent dike breach, resulting in oil reaching the Willamette River and adjacent property. George Shaver described operations at the Rivergate Oil Sump at a transportation conference held in June 1959 as follows:

> "We used to go down there during the summer and pump oil and water and various paint cleaning products into that sump. ...every summer we would burn it down as much as we could and get down to maybe two feet. Today we hardly put any oil in the dump. Maybe once every 4 or 5 months we put in 4 or 5 thousand barrels ...the thing is getting to the point where it is within 2 feet of the top."

10.2 NW Front Avenue Site

There have been multiple petroleum-related releases at the NW Front Avenue site. During decommissioning of two 10,000-gallon diesel underground storage tanks (USTs) in 1992, soil samples collected from the tank excavation revealed diesel concentrations up to 8,000 mg/kg, indicating a release had occurred. Approximately 78 cubic yards of soil were removed, and confirmation sampling showed that residual diesel contamination was present at up to 230 parts per million (ppm), but was within the acceptable cleanup level of 500 ppm. Groundwater was not encountered in the excavation. The DEQ issued a no further action letter (NFA) for the USTs on November 9, 2000 (LUST File 26-92-0034).

On March 24, 1994, a petroleum release occurred during the filling of an on-site AST when a fuel hose became disengaged from its fill port. Approximately 35 to 40 gallons of diesel was released onto to the ground surface. The release was reportedly contained, and no diesel reached the Willamette River. A total of 2.08 tons of soil, representing the upper 6 inches of soil in the spill area, were excavated and disposed of off-site. There were no confirmation samples collected to determine the effectiveness of the cleanup.

On August 13, 1997, the City of Portland Fire Department (HAZMAT rpt #97-034664) responded to a spill of anthraquinone (50% solution) on NW Front Avenue adjacent to the Shaver site (reportedly not associated with Shaver activities). Anthraquinone is yellow or light gray to gray-green crystal powder. Anthraquinone is a quinone derivative of anthracene and the parent substance of a large class of dyes and pigments. It is used in paper industry as a catalyst to increase the pulp production yield and to improve the fiber strength.

On September 29, 2001, a 41-foot Shaver tugboat, the Sandy, sank off their facility, however, no sheen was visible. The tugboat was submerged for 10 hours before being brought to surface.

11.0 Summary of Existing Sediment Chemistry Within, Adjacent to, and Downstream of the Site

11.1 NW Front Avenue Site

Two sediment samples, SD135 and SD135A, were collected downstream of the NW Front Avenue site near City Outfall #19 by Roy F. Weston, Inc. during the 1997 Portland Harbor Sediment Study. SD135 was collected from the upper 15 centimeters of sediment and SD135A was collected from the upper 85 centimeters of sediment (see Exhibit 1). DEQ's baseline concentrations were not exceeded in the surface sediment sample collected at SD135. However, SD135A sample results revealed bis(2-ethylhexyl)phthalate, metals (barium, cadmium, lead, mercury, silver, and zinc), and benzoic acid in exceedance of Portland Harbor Baseline concentrations. Metals concentrations observed in samples from locations both upstream and downstream of the SD135A sample location were lower than those detected in SD135A. This suggests a metal source area lies in the vicinity of the NW Front Avenue site.

Data were also compared to two sets of freshwater criteria: NOAA's threshold effects levels (TELs) and probable effects levels (PELs) (see Buchman 1999) and the consensus-based sediment quality guidelines developed by MacDonald et al. (2000), which contains probable effects concentrations (PECs) and threshold effect concentrations (TECs). Nickel and copper exceeded both TECs and TELs in SD135 surface sediments. Pyrene, chrysene, benzo(a)pyrene, benzo(a)anthracene, and phenanthrene also exceeded TELs in SD135 surface sediments. Copper, nickel, mercury, zinc, and pyrene exceeded TECs in subsurface SD135A sediments. Copper, nickel, pyrene, chrysene, benzo(a)pyrene, benz(a)anthracene, and phenanthrene also exceeded TELs in SD135A subsurface sediments. No PEC or PEL values were exceeded in either surface or subsurface SD135A sediments.

In June 1998, Shaver collected sediment samples from seven locations adjacent to their docks as part of a proposed dredging permit. The seven samples were combined to form one composite sample and analyzed for total metals, PAHs, PCBs, and organochlorine pesticides (see Exhibit 1). Analytical results in comparison to DEQ's baseline values are as follows:

- Corresponding with analytical results obtained for sample SD135A, concentrations of a number of metals (cadmium, copper, lead, mercury, and zinc) similarly exceeded their respective Portland Harbor Baseline concentrations
- PAH concentrations were below Portland Harbor Baseline concentrations.
- PCBs, which can be associated with used oil, were also detected at concentrations below Portland Harbor Baseline concentrations.

In comparison to criteria developed by Buchman (1999) and MacDonald et al. (2000), cadmium, copper, lead, mercury, and zinc exceeded both TECs and TELs in the composite sample. Nickel also exceeded the TEL, and lead exceeded the PEL. Among organics, total DDTs, total PCBs,

benzo(a)anthracene, and pyrene exceeded respective TECs and TELs. Chrysene and fluoranthene also exceeded TELs.

11.2 Rivergate Oil Sump

Three main stormwater lines with an associated network of catch basins and drains cross the OSM site from east to west and terminate in two outfalls [Central (001) and North (003)]. One other line drains the southeast portion of the site but discharges into the Willamette River via a City of Portland stormwater outfall south of the site on Ramsey Boulevard. The 001 outfall drains a portion of the area formerly occupied by the sump. In October 2000, sediment samples were collected from four stations in the vicinity of 001 outfall (Stations RB7, RB8, RB9, and RB10) (see Exponent 2001). Sediment samples were also collected near the southwestern corner of the property (Stations RB11 and RB12); however, no sediment samples were collected along the shoreline directly west of the historical sump.

Metals and total PCBs were consistently detected above freshwater sediment criteria in the vicinity of outfall 001. Metals, PCBs, and PAHs are chemicals of possible concern at OSM, and dissolved-phase total petroleum hydrocarbons are present in groundwater downgradient from the former oil sump (GSI 2003). Chromium was measured at concentrations exceeding its consensus-based probable effects concentration (PEC) at 3 of the 4 outfall 001 sampling stations. Lead, nickel, and zinc were also elevated above their respective PECs near outfall 001. Off the southwestern corner of the property, total PCBs were detected above the respective PEC value. Cadmium, chromium, copper, lead, nickel, and zinc exceeded threshold effect concentration (TEC) values at 3 of the 4 outfall 001 sampling locations. Arsenic also exceeded the TEC value at Station RB08 (located at outfall 001). In terms of organics, benzo(a)pyrene, an HPAH, exceeded the TEC value at Station RB08, and total PCBs exceeded TEC values at all sampling locations.

A similar list of chemicals exceeded probable effects levels (PELs) and threshold effects levels (TELs) as PECs and TECs, respectively. Chromium and lead exceeded PELs at 3 of the 4 outfall sampling stations. Zinc exceeded PELs at 2 of the 4 outfall sampling stations, and arsenic exceeded the PEL at one outfall station. Total PCBs exceeded PELs at 2 of the 4 outfall sampling stations and at one station located at the southwestern corner of the property. Metals, including arsenic, cadmium, chromium, copper, lead, nickel, and zinc, and total PCBs exceeded TELs at 3 of the 4 outfall sampling stations. Nickel and total PCBs also exceeded TELs at the southwestern corner of the site. Of note are the TEL exceedances of 5 PAHs (pyrene, fluoranthene, chrysene, benzo(a)pyrene, benz(a)anthracene, and phenanthrene) at Station RB08 located at the outfall.

12.0 Sources of Information

Buchman, M.F. 1999. NOAA Screening Quick Reference Tables (SQuiRTs), National Oceanic Atmospheric Administration, HAZMAT, report 99-1. Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, Seattle, WA.

DEQ. November 23, 1999. Strategy Recommendation, Shaver Transportation, ECSI #2377.

DEQ. June 10, 2003. Environmental Cleanup Site Information Database, Site Summary Report - Details for Oregon Steel Mills, Site ID 141. (http://www.deq.state.or.us/wmc/ecsi/ecsidetail.asp?seqnbr=141)

DEQ. June 10, 2003. Environmental Cleanup Site Information Database, Site Summary Report - Details for Shaver Transportation, Site ID 2377. (http://www.deq.state.or.us/wmc/ecsi/ecsidetail.asp?seqnbr=2377)

EPA. May 1998. Portland Harbor Sediment Investigation Report, Multnomah County, Oregon. Doc. Control No. 04000-019-036-AACE.

Exponent. 2003. Pre-Remedial Investigation Field Activities Data Report, Oregon Steel Mills, Inc. Prepared for Stoel Rives LLP, Portland Oregon. Prepared by Exponent, Portland, Oregon.

GeoEngineers. January 30, 2002. Preliminary Assessment Report, Shaver Transportation Site, 4900 Northwest Front Avenue, Portland, Oregon. Prepared for Shaver Transportation.

MacDonald, D.D., C.G. Ingersoll, T.A. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

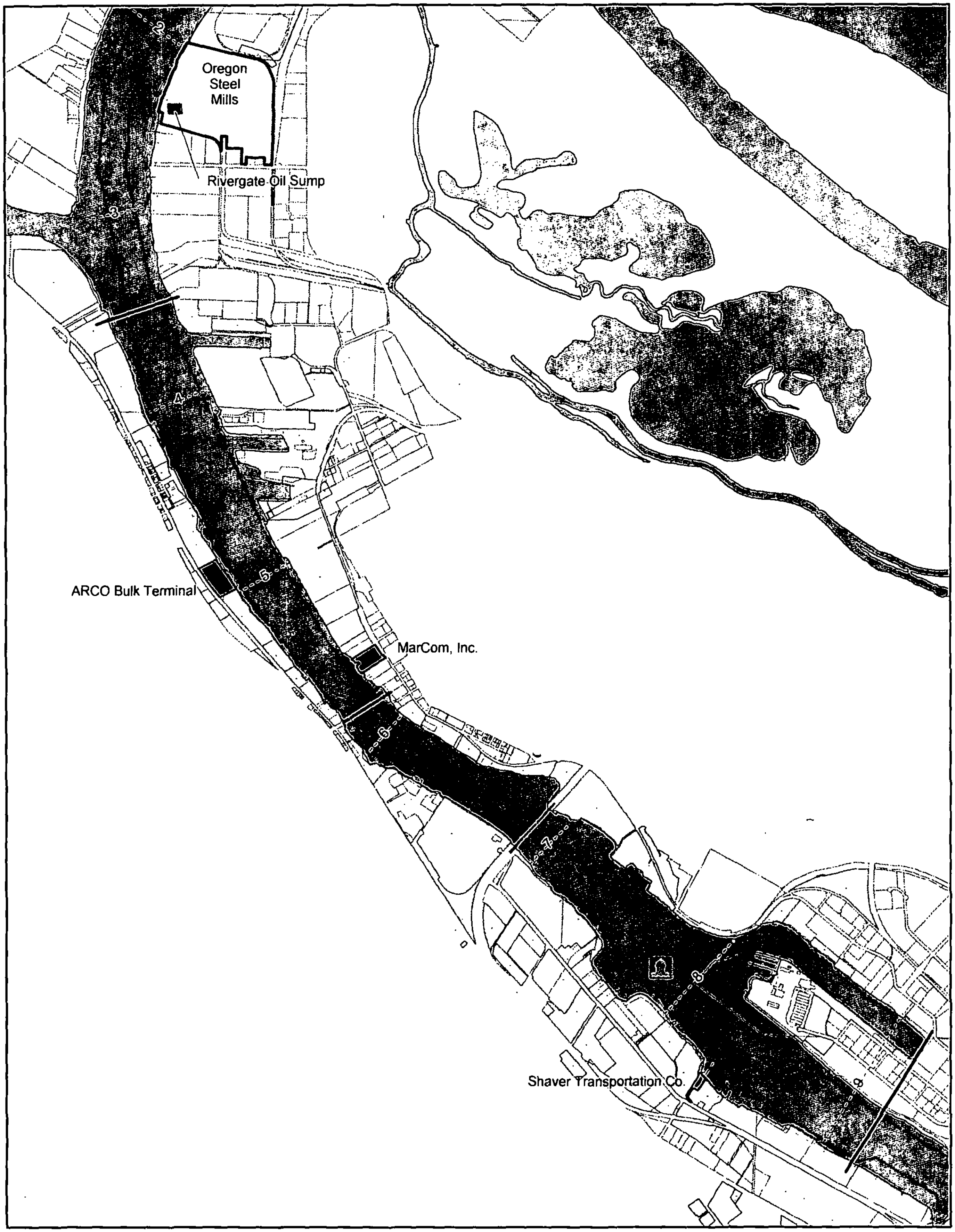
Port of Portland Records, various boxes files, including Lease between the Port of Portland and Shaver Transportation dated June 1, 1946, Port of Portland Memorandum from Mr. Charleson to Mr. Winn dated May 14, 1953, and transcript excerpt dated June 23, 1959 from conference in the Shaver offices.

Oregon Historical Society, "History of the Shaver Transportation Company, 1893-1959."

Shaver Transportation Company, "Pilot House Logs."

Attachments

Figure 1
Figure 2
Figure 2A
EXHIBIT 1



FEATURE SOURCES:
Taxlot features: Metro RLIS
Channel & River Mile information: ACOE
Docks & Structures: SEA & 2001 aerial ref

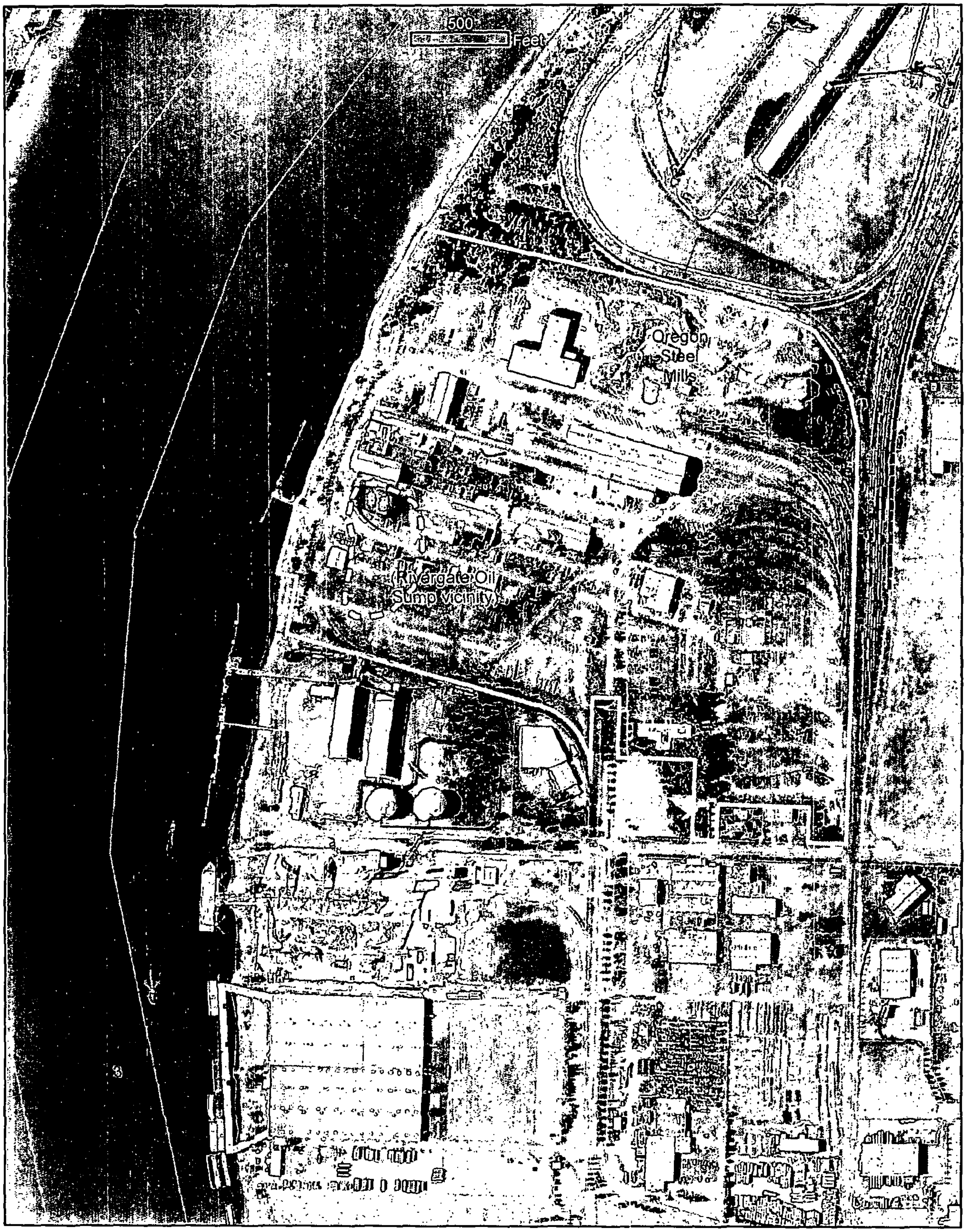
Legend:

- Shaver is associated with over water activities.
- ISA boundary
- River Miles
- Waterfront taxlots
- Docks and Structures
- Bridges

Portland Harbor
PRP Information Summary

Figure 1

...Portland_Harbor\LWG-Map-Projects\Upland_Source_Task\A-sheet__Property_wPhoto_ASSRmap.mxd), Plot Date: 7/8/2003



LWG Lower Willamette Group

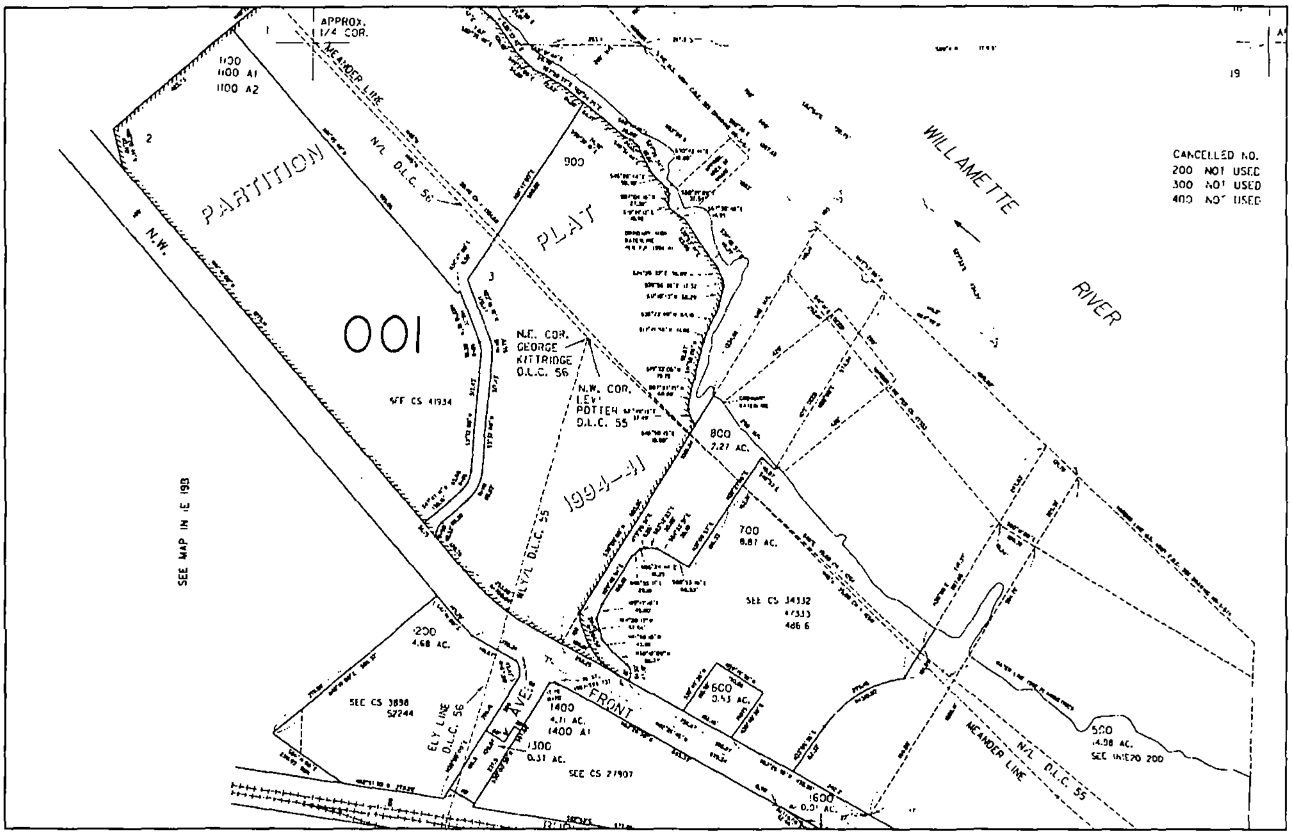
FEATURE SOURCES
Taxlot features. Metro RLIS
Channel & River mile Information ACOE
Photo Date 2001
Assessors Parcel Map dipp
Multnomah County online maps.

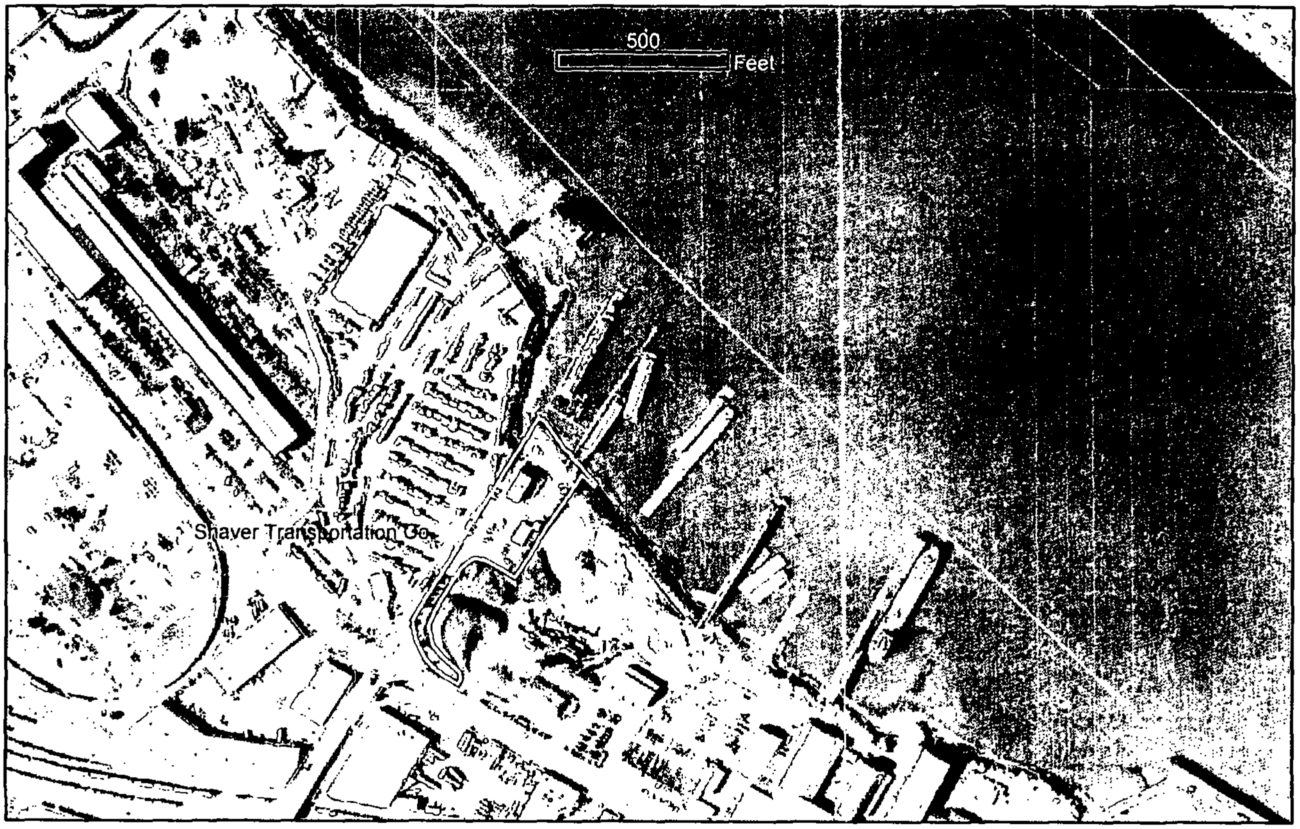
Legend:
- River Miles
- Navigation Channel
- ISA boundary

Portland Harbor
PRP Information Summary
Rivergate Oil Sump/
Oregon Steel Mills

Figure 2

...Portland_Harbor\LWG-Map-Projects\Upland_Source_Task\A-sheet__Property_wPhoto_ASSRmap.mxd), Plot Date: 7/8/2003





FEATURE SOURCES
Taxlot features: Metro RLIS.
Channel & River mile information: ACOE.
Photo Date: 2001.
Assessors Parcel Map disp.
Multnomah County online maps

Legend:
River Miles
Navigation Channel
ISA boundary

TRIPLIN Environmental Associates

LWG LOWER WILLAMETTE GROUP

Portland Harbor
PRP Information Summary
Shaver Transportation Co.

Figure 2a

EXHIBIT 1

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue
Suite 400
Portland, OR 97201-4987
(503) 229-5263 Voice
TTY (503) 229-5471

December 7, 1999

Mr. George Shaver
Shaver Transportation
PO Box 10324
Portland, Oregon 97210

Re: Request for Performance of Preliminary Assessment with Sampling – Shaver Transportation Site

Dear Mr. Shaver:

This letter informs you of the results of our review of information regarding hazardous substance contamination at the Shaver Transportation facility located at 4900 NW Front Avenue in Portland, Oregon. The Oregon Department of Environmental Quality (DEQ) has determined that the Shaver Transportation site is a high priority for a preliminary assessment with sampling and requests that Shaver Transportation perform a preliminary assessment with sampling in accordance with the Environmental Cleanup Law, Oregon Revised Statutes (ORS) 465.200 *et seq.*

The Shaver Transportation facility is located within or near a portion of the Willamette River known as the Portland Harbor. A 1997 investigation revealed significant contamination of sediments within the harbor. DEQ has undertaken review of available information regarding properties throughout the harbor to identify potential sources of the sediment contamination. The results of DEQ's review for the Shaver Transportation facility are summarized in the enclosed Strategy Recommendation

Based on this review, DEQ has determined additional information is necessary to determine whether hazardous substances have been released or threaten to be released at the Shaver Transportation facility and come to be located in Willamette River sediments. The preliminary assessment with sampling will fully evaluate all upland, in-water and over-water activities that might have resulted in the release of hazardous substances and include sufficient sampling to assess whether hazardous substances have come to be located in Willamette River sediments at or near the Shaver Transportation facility. At a minimum, sampling will include the collection of surface and subsurface sediment samples at appropriate points adjacent to the Shaver Transportation facility.

TABLE 1

River Sediment Contaminant Concentrations (1997)

Shaver Transportation

Contaminant	Units	*Downstream* SD131	*Shaver Transportation* SD135	*Shaver Transportation* SD135A	*Upstream* SD137	Apparent Portland Harbor Sediment Baseline Maximum Value
Aluminum	*ppm*	36800	33000	40900	38400	42800
Antimony	*ppm*	5	<5	<5	6	<5
Arsenic	*ppm*	<5	<5	<5	<5	<5
Barium	*ppm*	170	157	197	181	195
Beryllium	*ppm*	0.56	0.53	0.56	0.6	0.7
Cadmium	*ppm*	0.5	0.4	0.7	0.5	0.6
Chromium	*ppm*	34.7	31.6	36.7	37.8	41
Cobalt	*ppm*	17.4	15.6	18.9	18.2	19.7
Copper	*ppm*	39.8	37.3	55.7	42.2	60
Iron	*ppm*	38700	35700	41400	41400	45000
Lead	*ppm*	20	16	32	17	30
Manganese	*ppm*	642	505	658	573	810
Mercury	*ppm*	0.06	0.05	0.2	0.07	0.1
Nickel	*ppm*	28	26	30.2	29	32
Selenium	*ppm*	10	8	6	15	15
Silver	*ppm*	0.7	0.9	1.5	0.8	1.4
Thallium	*ppm*	9	10	6	15	13
Titanium	*ppm*	NA	NA	NA	1960	2075
Vanadium	*ppm*	94.2	87.5	108	102	112
Zinc	*ppm*	126	103	181	103	118
2-Methylnaphthalene	*ppb*	<20	<20	54	<20	150
4-Methylphenol	*ppb*	380	340	290	590	680
Benzoic Acid	*ppb*	<200	<200	380	<200	<200
Benzyl Alcohol	*ppb*	<20	<20	<20	<20	<20
bis(2-Ethylhexyl)phthalate	*ppb*	210	320	270	250	390
Butylbenzylphthalate	*ppb*	<20	<20	<20	<20	<20
Carbazole	*ppb*	<20	<20	<20	<20	100
Di-N-Butylphthalate	*ppb*	<20	<20	<20	<20	<20
Di-N-Octylphthalate	*ppb*	<20	<20	<20	<20	<20
Dibenzofuran	*ppb*	<20	<20	<20	<20	100
Dimethylphthalate	*ppb*	<20	<20	<20	<20	<20
Pentachlorophenol	*ppb*	<100	<100	<100	<99	Detect
Phenol	*ppb*	<20	<20	<20	<20	<20
LPAHs (total)	*ppb*	59	71	368	67	700
HPAHs (total)	*ppb*	405	438	894	462	2400
DDTs (total)	*ppb*	NA	NA	NA	4.8	220
PCBs (total)	*ppb*	NA	NA	NA	<40	<180
Organotins (total)	*ppb*	NA	NA	NA	<5.25	300
2,4-D	*ppb*	NA	NA	NA	NA	<3.3
2,4-DB	*ppb*	NA	NA	NA	NA	<5
TOC	%	1.1	1	1.7	1.3	2

Water Depth	*ft*	10	16	20	10
Sediment Sample Depth	*cm*	0-13	0-15	0-85	0-16

Notes:

100 = Value exceeds Portland Harbor Baseline Value

100 = Value is Greater than 2X Portland Harbor Baseline Value

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Shaver Transport
Project: Shaver Transport
Sample Matrix: Water

Service Request: K9804103
Date Collected: 6/23/98
Date Received: 6/24/98
Date Extracted: 7/7/98

Total Metals
Units: mg/Kg (ppm)
Dry Weight Basis

			Sample Name:	1 thru 7 Composite		Method Blank
			Lab Code:	K9804103-008		K9804103-MB
			Date Analyzed:	7/9/98		7/9/98
Analyte	EPA Method	MRL			Portland Harbor Sediment Baseline	
Antimony	200.8	0.02		0.10	< 5	ND
Arsenic	200.8	0.5		2.8	< 5	ND
Cadmium	200.8	0.02		1.12	0.6	ND
Chromium	200.8	0.2		24.5	41	ND
Copper	200.8	0.1		61.7	60	ND
Lead	200.8	0.02		103	30	ND
Mercury	7471A	0.02		0.22	0.1	ND
Nickel	200.8	0.2		20.2	32	ND
Silver	200.8	0.02		0.47	L4	ND
Zinc	200.8	0.5		201	118	ND

Table 2: Shaver Transportation Sediment Sampling Results (1998)

Approved By: JC Date: 7/13/98

22XXEPA/181094
041021CP.JC1 - Sample 7/13/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

ent:	Shaver Transport	Service Request:	K9804103
oject:	Shaver Transport	Date Collected:	6/23/98
mple Matrix:	Soil	Date Received:	6/24/98
		Date Extracted:	6/29/98

Base Neutral/Acid Semivolatile Organic Compounds
EPA 3550A in Conjunction with GC/MS SIM Method
Units: ug/Kg (ppb)

		Sample Name:	1 Thru 7 Composite		Method Blank
		Lab Code:	K9804103-008		KWG9801808-4
		Date Analyzed:	7/9-15/98		7/8-15/98
				PORTLAND HARBOR Sediment Baseline	
ase Neutral Analyte	MRL				
cenaphthene	10	Total LPAHs = 482 ppb	48	700 ppb	ND
cenaphthylene	10		13		ND
nthracene	10		52		ND
uorene	10		62		ND
Methylnaphthalene	10		40		ND
aphthalene	10		27		ND
henanthrene	10		240		ND
enz(a)anthracene	10	Total HPAHs = 1,340 ppb	110	2,400 ppb	ND
ibenz(a,h)anthracene	10		14		ND
hrysene	10		140		ND
uoranthene	10		320		ND
enzo(b)fluoranthene	10		95		ND
enzo(k)fluoranthene	10		81		ND
enzo(g,h,i)perylene	10		81		ND
yrene	10		320		ND
enzo(a)pyrene	10		98		ND
ideno(1,2,3-cd)pyrene	10		81		ND
henol	40		ND		ND
-Methylphenol	5		ND		ND
-Methylphenol	40		48		ND
,4-Dimethylphenol	5		ND		ND
entachlorophenol	30		ND		ND

Approved By: CClkeeinos Date: 7/15/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Shaver Transport	Service Request:	K9804103
Project:	Shaver Transport	Date Collected:	NA
Sample Matrix:	Soil	Date Received:	NA
		Date Extracted:	6/30/98

Polychlorinated Biphenyls (PCBs)
EPA Methods 3550A/8082
Units: ug/Kg (ppb)
Dry Weight Basis

		Sample Name:	1 Thru 7 Composite	Method Blank
		Lab Code:	K9804103-008	K980630-MB
		Date Analyzed:	7/9/98	7/9/98
Analyte	**MRL**			
Aroclor 1016	10		ND	ND
Aroclor 1221	10		ND	ND
Aroclor 1232	10		ND	ND
Aroclor 1242	10		ND	ND
Aroclor 1248	10		39	ND
Aroclor 1254	10		48	ND
Aroclor 1260	10		36	ND

Total PCBs = 123 ppb

PORTLAND HARBOR
Baseline Value = < 180 ppb

Approved By: Jy Date: 7-10-98

3522/CDL/1285M
0410/SVG.VN1 - 1-3 7/9/98

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

ient: Shaver Transport
oject: Shaver Transport
mple Matrix: Soil

Service Request: K9804103
Date Collected: 6/23/98
Date Received: 6/24/98
Date Extracted: 6/30/98

Organochlorine Pesticides
EPA Methods 3550A/8081A
Units: ug/Kg (ppb)
Dry Weight Basis

Sample Name:		1 Thru 7 Composite	Method Blank
Lab Code:		K9804103-008	KWG9801872-7
Date Analyzed:		7/16/98	7/16/98
nalyte	MRL		
pha-BHC	2	ND	ND
ta-BHC	2	ND	ND
amma-BHC (Lindane)	2	ND	ND
elta-BHC	2	ND	ND
eptachlor	2	ND	ND
ldrin	2	ND	ND
eptachlor Epoxide	2	ND	ND
ndosulfan I	2	ND	ND
ieldrin	2	2	ND
,4'-DDE	2	5	ND
ndrin	2	ND	ND
ndosulfan II	2	ND	ND
,4'-DDD	2	3	ND
ndrin Aldehyde	2	ND	ND
ndosulfan Sulfate	2	ND	ND
,4'-DDT	2	ND	ND
lethoxychlor	4	ND	ND
oxaphene	30	ND	ND
hlordane	10	ND	ND

Total DDTs = 8 ppb

PORTLAND HARBOR Sediment Baseline = 220 ppb

Approved By: Jay Date: 7-20-98

00010

Page No.:

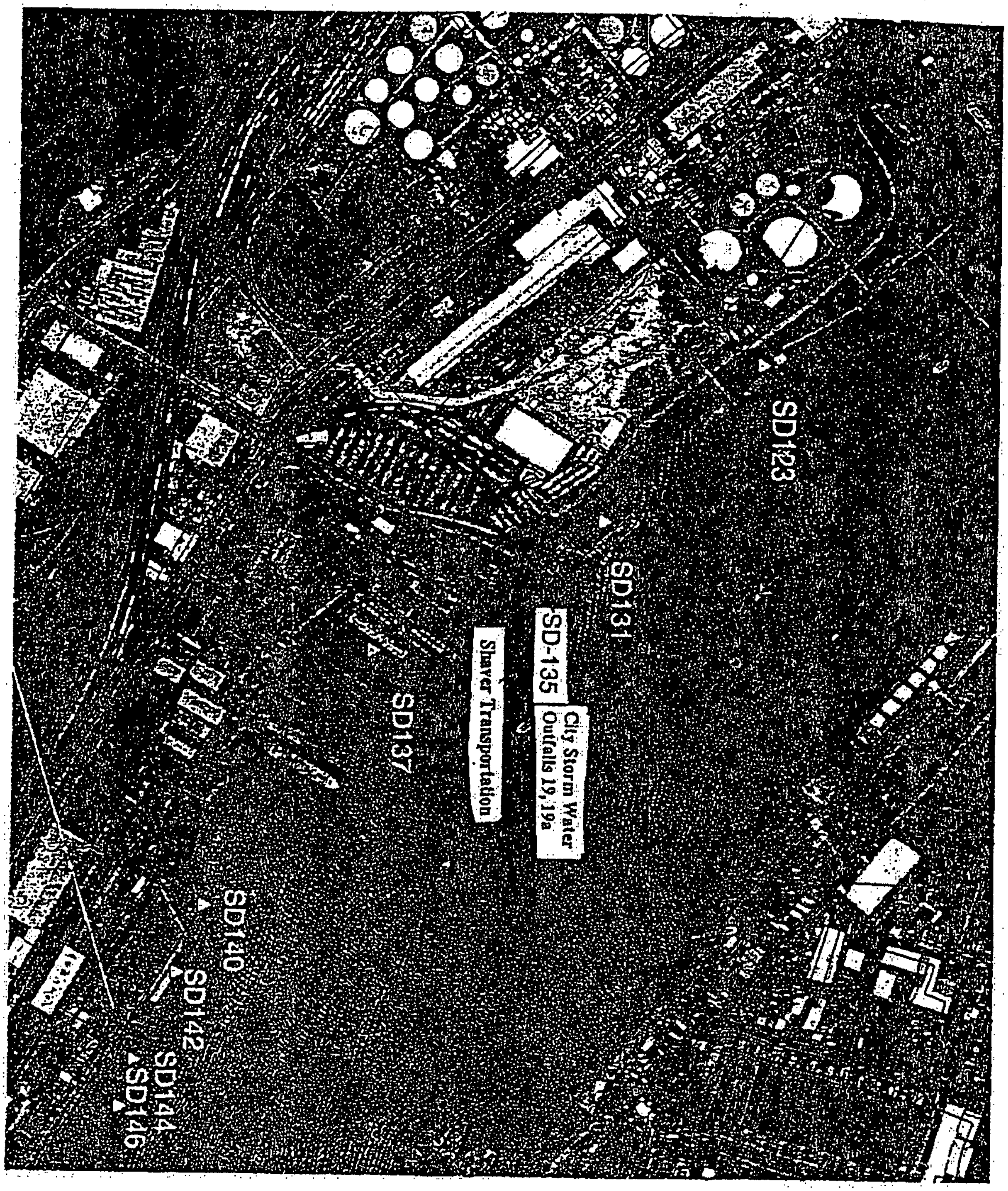


Figure 3: Sedimant Sampling Stations (EPA, 1997)

<u>Explanation:</u> ▲surface sediment sample stations

——→ North ●surface sediment and sediment core locations

EXHIBIT 1

Exponent

Pre-Remedial Investigation
Field Activities
Data Report
Oregon Steel Mills, Inc.
Portland, Oregon Mill

Prepared for

Stoel Rives LLP
900 S.W. Fifth Avenue
Suite 2300
Portland, Oregon

Prepared by

Exponent
4000 Kruse Way Place
Building Two, Suite 285
Lake Oswego, OR 97305

February 2, 2001

Doc. No.: 8601526.001 0203 0101 LM08

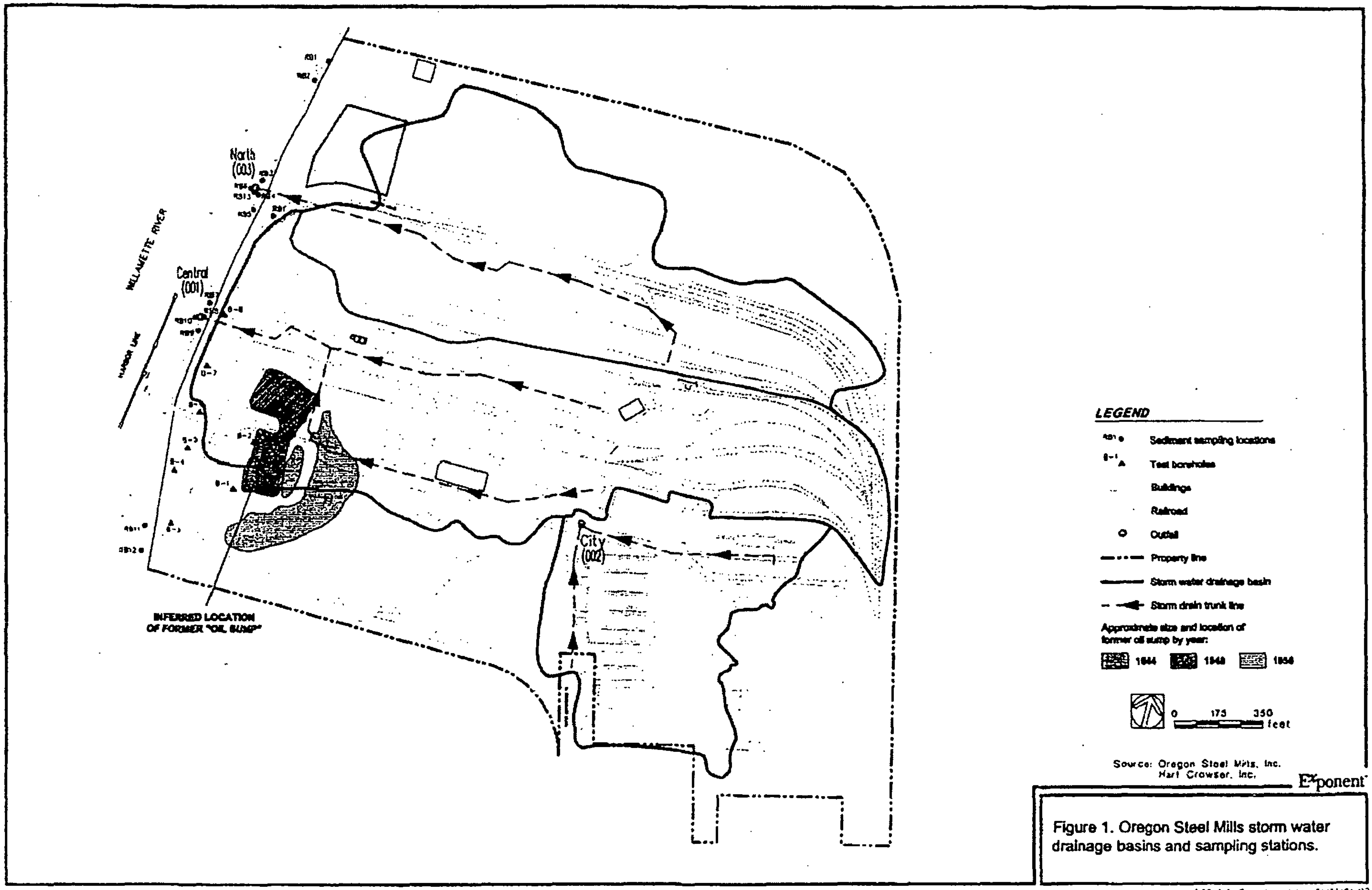


Figure 1. Oregon Steel Mills storm water drainage basins and sampling stations.

Table 1. Sediment data

Chemical	Units	RB1 10/10/00 SD0001 0 - 10 cm	RB2 10/10/00 SD0002 0 - 10 cm	RB3 10/10/00 SD0003 0 - 10 cm	RB4a 10/10/00 SD0004 0 - 10 cm	RB4b 10/10/00 SD0014 0 - 30 cm	RB5 10/10/00 SD0005 0 - 10 cm
Metals							
Antimony	mg/kg	10.2 *U*	10.3 *U*	10.4 *U*	10.8 *U*	11.1 *U*	10.3 *U*
Arsenic	mg/kg	2.2	2.2	4.6	2.0	2.8	6.8
Beryllium	mg/kg	1.0 *U*	1.0 *U*	1.0 *U*	1.1 *U*	1.1 *U*	1.0 *U*
Cadmium	mg/kg	1.0 *U*	1.0 *U*	1.0 *U*	1.5	1.1 *U*	1.0 *U*
Chromium	mg/kg	21.7 *J*	26.1 *J*	640 *J*	229 *J*	277 *J*	252 *J*
Copper	mg/kg	12.8	13.4	102	38.5	54.4	36.0
Lead	mg/kg	20.4 *U*	20.5 *U*	20.8 *U*	109	108	67.5
Mercury (total)	mg/kg	0.020 *U*	0.020 *U*	0.020 *U*	0.020	0.030	0.070
Nickel	mg/kg	12.5	12.6	38.7	19.9	34.0	15.7
Selenium	mg/kg	1.0 *U*	1.1 *U*	1.0 *U*	1.1 *U*	1.1 *U*	1.0 *U*
Silver	mg/kg	2.0 *U*	2.0 *U*	2.1 *U*	2.2 *U*	2.2 *U*	2.1 *U*
Thallium	mg/kg	1.0 *U*	1.1 *U*	1.0 *U*	1.1 *U*	1.1 *U*	1.0 *U*
Zinc	mg/kg	68.9	74.3	116	698	479	345
Fuels							
Diesel fuel	mg/kg	--	--	--	--	--	--
Gasoline	mg/kg	--	--	--	--	--	--
Heavy fuel oil	mg/kg	--	--	--	--	--	--
Jet Fuel as Jet A	mg/kg	--	--	--	--	--	--
Jet Fuel as JP-4	mg/kg	--	--	--	--	--	--
Kerosene	mg/kg	--	--	--	--	--	--
Lube Oil	mg/kg	--	--	--	--	--	--
Mineral Spirits	mg/kg	--	--	--	--	--	--
Naphtha & sp naphthas	mg/kg	--	--	--	--	--	--
PCBs							
Aroclor® 1016	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	1.0 *U*	0.10 *U*
Aroclor® 1221	mg/kg	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*	2.0 *U*	0.20 *U*
Aroclor® 1232	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	1.0 *U*	0.10 *U*
Aroclor® 1242	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	1.0 *U*	0.10 *U*
Aroclor® 1248	mg/kg	**0.14**	**0.18**	**0.66**	**1.6**	**9.3**	**2.5**
Aroclor® 1254	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	1.0 *U*	0.10 *U*
Aroclor® 1260	mg/kg	0.10 *U*	0.10 *U*	**0.15**	**0.17**	1.0 *U*	**0.29**
Grain Size							
Gravel	%	35.4	32.6	62.0	69.9	48.6	84.6
Very coarse sand	%	6.47	6.00	12.3	4.80	9.13	5.16
Coarse sand	%	15.5	13.2	13.3	12.5	13.9	6.04
Medium sand	%	41.9	46.3	10.2	14.5	18.3	4.48
Fine sand	%	1.43	1.61	2.24	0.530	3.44	0.700
Very fine sand	%	0.0500	0.0700	0.450	0.0700	1.44	0.130
Silt	%	7.15	6.55	7.08	7.99	2.67	6.43
Clay	%	0.253	0.00	0.0300	0.0500	0.230	0.0500
Other Analytes							
Total organic carbon	%	0.17	0.11	0.56	0.41	0.32	0.54
Total solids	%	95.0	95.6	95.2	89.2	89.6	95.3

Table 1. (cont.)

Chemical	Units	RB6 10/10/00 SD0006 0 - 10 cm	RB6 (dup) 10/10/00 SD0007 0 - 10 cm	RB7 10/10/00 SD0008 0 - 10 cm	RB8 10/10/00 SD0009 0 - 10 cm	RB9 10/10/00 SD0010 0 - 10 cm	RB10 10/10/00 SD0011 0 - 10 cm
Metals							
Antimony	mg/kg	11.8 *U*	11.5 *U*	10.5 *U*	9.9 *U*	10.4 *U*	12.4 *U*
Arsenic	mg/kg	3.0	2.8	1.8	**132**	6.6	9.3
Beryllium	mg/kg	1.2 *U*	1.1 *U*	1.1 *U*	0.99 *U*	1.1 *U*	1.2 *U*
Cadmium	mg/kg	1.2 *U*	1.1 *U*	1.1 *U*	2.1	1.1 *U*	1.5
Chromium	mg/kg	819 *J*	693 *J*	13.1 *J*	223 *J*	252 *J*	544 *J*
Copper	mg/kg	69.6	41.7	11.1	103	145	75.1
Lead	mg/kg	34.3	75.6	21.0 *U*	103	166	110
Mercury (total)	mg/kg	0.030	0.030	0.020 *U*	0.060	0.060	0.050
Nickel	mg/kg	22.4	16.5	12.4	44.0	60.8	22.0
Selenium	mg/kg	1.2 *U*	1.2 *U*	1.1 *U*	1.0 *U*	1.1 *U*	1.2 *U*
Silver	mg/kg	2.4 *U*	2.3 *U*	2.1 *U*	2.3	2.2	2.5 *U*
Thallium	mg/kg	1.2 *U*	1.2 *U*	1.1 *U*	1.0 *U*	1.1 *U*	1.2 *U*
Zinc	mg/kg	212	338	43.1	**823**	209	341
Fuels							
Diesel fuel	mg/kg	--	--	--	--	--	--
Gasoline	mg/kg	--	--	--	--	--	--
Heavy fuel oil	mg/kg	--	--	--	--	--	--
Jet Fuel as Jet A	mg/kg	--	--	--	--	--	--
Jet Fuel as JP-4	mg/kg	--	--	--	--	--	--
Kerosene	mg/kg	--	--	--	--	--	--
Lube Oil	mg/kg	--	--	--	--	--	--
Mineral Spirits	mg/kg	--	--	--	--	--	--
Naphtha & sp naphthas	mg/kg	--	--	--	--	--	--
PCBs							
Aroclor® 1016	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1221	mg/kg	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*
Aroclor® 1232	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1242	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1248	mg/kg	**0.77**	**0.88**	0.10 *U*	**0.19**	**0.42**	**0.29**
Aroclor® 1254	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1260	mg/kg	**0.39**	**0.14**	0.10 *U*	0.10 *U*	0.13	0.10 *U*
Grain Size							
Gravel	%	49.3	47.6	21.2	79.1	41.5	61.4
Very coarse sand	%	11.6	9.39	13.1	1.94	15.5	9.40
Coarse sand	%	16.0	19.0	16.6	3.29	18.4	14.4
Medium sand	%	20.4	23.7	37.2	8.63	17.9	15.4
Fine sand	%	1.08	1.46	11.5	3.92	4.55	2.53
Very fine sand	%	0.0900	0.120	0.320	2.17	1.41	0.330
Silt	%	7.16	8.51	6.41	4.71	7.60	6.99
Clay	%	0.0400	0.00	0.170	3.07	0.0800	0.00
Other analytes							
Total organic carbon	%	0.18	0.34	0.16	1.91	0.42	0.57
Total solids	%	82.5	82.8	95.2	24.2	93.8	80.0

Table 1. (cont.)

Chemical	Units	RB11 10/10/00 SD0012 0 - 10 cm	RB12 10/10/00 SD0013 0 - 10 cm	RB13 10/10/00 SD0015 0 - 30 cm	RB13 10/10/00 SD0016 30 - 60 cm
Metals					
Antimony	mg/kg	10.4 *U*	9.9 *U*	11.0 *U*	10.5 *U*
Arsenic	mg/kg	2.2	2.2	2.2	2.2
Beryllium	mg/kg	1.0 *U*	0.99 *U*	1.1 *U*	1.1 *U*
Cadmium	mg/kg	1.0 *U*	0.99 *U*	1.1 *U*	1.1 *U*
Chromium	mg/kg	15.2 *J*	14.6 *J*	489 *J*	199 *J*
Copper	mg/kg	12.6	12.9	148	30.2
Lead	mg/kg	20.8 *U*	19.8 *U*	78.0	40.9
Mercury (total)	mg/kg	0.020 *U*	0.020 *U*	0.030	0.040
Nickel	mg/kg	17.1	19.5	58.4	17.2
Selenium	mg/kg	1.0 *UJ*	0.99 *U*	1.1 *U*	1.0 *U*
Silver	mg/kg	2.1 *U*	2.0 *U*	2.2 *U*	2.1 *U*
Thallium	mg/kg	1.0 *U*	0.99 *U*	1.1 *U*	1.0 *U*
Zinc	mg/kg	54.4	66.7	326	234
Fuels					
Diesel fuel	mg/kg	--	--	10 *U*	10 *U*
Gasoline	mg/kg	--	--	10 *U*	10 *U*
Heavy fuel oil	mg/kg	--	--	25 *U*	25 *U*
Jet Fuel as Jet A	mg/kg	--	--	10 *U*	10 *U*
Jet Fuel as JP-4	mg/kg	--	--	10 *U*	10 *U*
Kerosene	mg/kg	--	--	10 *U*	10 *U*
Lube Oil	mg/kg	--	--	81	79
Mineral Spirits	mg/kg	--	--	10 *U*	10 *U*
Naphtha & sp naphthas	mg/kg	--	--	10 *U*	10 *U*
PCBs					
Aroclor® 1016	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1221	mg/kg	0.20 *U*	0.20 *U*	0.20 *U*	0.20 *U*
Aroclor® 1232	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1242	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1248	mg/kg	0.10 *U*	0.10 *U*	**1.1**	**1.4**
Aroclor® 1254	mg/kg	0.10 *U*	0.10 *U*	0.10 *U*	0.10 *U*
Aroclor® 1260	mg/kg	0.10 *U*	0.10 *U*	**0.16**	**0.20**
Grain Size					
Gravel	%	1.59	0.410	--	--
Very coarse sand	%	1.09	0.530	--	--
Coarse sand	%	19.7	24.6	--	--
Medium sand	%	70.0	71.8	--	--
Fine sand	%	7.06	4.50	--	--
Very fine sand	%	0.490	0.0400	--	--
Silt	%	7.77	6.65	--	--
Clay	%	0.00	0.00	--	--
Other analytes					
Total organic carbon	%	0.11	0.050 *U*		
Total solids	%	95.2	97.2	90.0	79.7

Note: -- not analyzed
J - estimated
U - undetected at detection limit shown
Bold values exceed dredged material screening values.

Table 2. Sediment SVOC data

Chemical	Units	RB1 10/10/00 SD0001 0 - 10 cm	RB2 10/10/00 SD0002 0 - 10 cm	RB3 10/10/00 SD0003 0 - 10 cm	RB4a 10/10/00 SD0004 0 - 10 cm	RB4b 10/10/00 SD0014 0 - 30 cm	RB5 10/10/00 SD0005 0 - 10 cm	RB6 10/10/00 SD0006 0 - 10 cm	RB6 (dup) 10/10/00 SD0007 0 - 10 cm	RB7 10/10/00 SD0008 0 - 10 cm
Total Polycyclic Aromatic Hydrocarbons[a]		200 *U*	190 *U*	290 *L*	**55000 *L***	460 *L*	240 *L*	200 *U*	200 *L*	200 *L*
Low Molecular Weight PAH[a,b]		69 *U*	68 *U*	69 *U*	**15000**	100 *L*	62 *U*	70 *U*	67 *U*	69 *U*
2-Methylnaphthalene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	440	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Acenaphthene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	270	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Acenaphthylene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	23	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Anthracene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	**1,900**	14	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Fluorene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	**1,100**	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Naphthalene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	**3,100**	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Phenanthrene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	**7,700**	40	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
High Molecular Weight PAH[a,c]		130 *U*	120 *U*	220 *L*	**40000 *L***	360 *L*	180 *L*	130 *U*	130 *L*	130 *L*
Benz[a]anthracene	µg/kg	9.9 *U*	9.7 *U*	15	**4,000**	29	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Benzo[a]pyrene	µg/kg	9.9 *U*	9.7 *U*	28	**4,300**	39	19	10 *U*	9.6 *U*	9.9 *U*
Benzo[b]fluoranthene	µg/kg	9.9 *U*	9.7 *U*	21	**3,500**	31	21	10 *U*	11	9.9 *U*
Benzo[ghi]perylene	µg/kg	20 *U*	19 *U*	26	**2,900**	37	20	20 *U*	19 *U*	20 *U*
Benzo[k]fluoranthene	µg/kg	9.9 *U*	9.7 *U*	19	**3,600**	32	19	10 *U*	9.6 *U*	9.9 *U*
Chrysene	µg/kg	9.9 *U*	9.7 *U*	21	**3,800**	44	22	10 *U*	11	9.9 *U*
Dibenz[a,h]anthracene	µg/kg	20 *U*	19 *U*	20 *U*	970 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
Fluoranthene	µg/kg	9.9 *U*	9.7 *U*	18	**7,600**	42	13	10 *U*	9.6 *U*	12
Indeno[1,2,3-cd]pyrene	µg/kg	20 *U*	19 *U*	26	**3,600**	31	18 *U*	20 *U*	19 *U*	20 *U*
Pyrene	µg/kg	9.9 *U*	9.7 *U*	22	**5,700**	59	18	10 *U*	10	12
Miscellaneous Organic Compounds										
1,2,4-Trichlorobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
1,2-Dichlorobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
1,3-Dichlorobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
1,4-Dichlorobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
2,4,5-Trichlorophenol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
2,4,6-Trichlorophenol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
2,4-Dichlorophenol	µg/kg	99 *U*	97 *U*	99 *U*	97 *U*	97 *U*	89 *U*	100 *U*	96 *U*	99 *U*
2,4-Dimethylphenol	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
2,4-Dinitrophenol	µg/kg	300 *U*	290 *U*	300 *U*	290 *U*	290 *U*	270 *U*	300 *U*	290 *U*	300 *U*
2,4-Dinitrotoluene	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*

Table 2. (cont.)

Chemical	Units	RB1 10/10/00 SD0001 0 - 10 cm	RB2 10/10/00 SD0002 0 - 10 cm	RB3 10/10/00 SD0003 0 - 10 cm	RB4a 10/10/00 SD0004 0 - 10 cm	RB4b 10/10/00 SD0014 0 - 30 cm	RB5 10/10/00 SD0005 0 - 10 cm	RB6 10/10/00 SD0006 0 - 10 cm	RB6 (dup) 10/10/00 SD0007 0 - 10 cm	RB7 10/10/00 SD0008 0 - 10 cm
2,6-Dinitrotoluene	µg/kg	20 *U*	19 *U*	20 *U*	19 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
2-Chloronaphthalene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
2-Chlorophenol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
2-Methyl-4,6-dinitrophenol	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
2-Methylphenol	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
2-Nitroaniline	µg/kg	20 *U*	19 *U*	20 *U*	19 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
2-Nitrophenol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
3,3'-Dichlorobenzidine	µg/kg	70 *UJ*	70 *UJ*	70 *UJ*	70 *UJ*	70 *UJ*	70 *UJ*	80 *UJ*	80 *UJ*	70 *UJ*
3- and 4-Methylphenol Coelution	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
3-Nitroaniline	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
4-Bromophenyl-phenyl ether	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
4-Chloro-3-methylphenol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
4-Chloroaniline	µg/kg	50 *UJ*	49 *UJ*	49 *UJ*	48 *UJ*	49 *UJ*	44 *UJ*	50 *UJ*	48 *UJ*	49 *UJ*
4-Chlorophenyl-phenyl ether	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
4-Nitroaniline	µg/kg	99 *U*	97 *U*	99 *U*	97 *U*	97 *U*	89 *U*	100 *U*	96 *U*	99 *U*
4-Nitrophenol	µg/kg	99 *U*	97 *U*	99 *U*	97 *U*	97 *U*	89 *U*	100 *U*	96 *U*	99 *U*
Benzoic acid	µg/kg	400 *U*	390 *U*	400 *U*	390 *U*	390 *U*	360 *U*	400 *U*	380 *U*	400 *U*
Benzyl alcohol	µg/kg	50 *U*	49 *U*	49 *U*	48 *U*	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*
bis[2-Chloroethoxy]methane	µg/kg	20 *U*	19 *U*	20 *U*	19 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
bis[2-Chloroethyl]ether	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
bis[2-Chloroisopropyl]ether	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
bis[2-Ethylhexyl]phthalate	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
Butylbenzyl phthalate	µg/kg	20 *U*	19 *U*	20 *U*	19 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
Carbazole	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	1,500	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Dibenzofuran	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	1,000	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Diethyl phthalate	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Dimethyl phthalate	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Di-*n*-butyl phthalate	µg/kg	20 *U*	19 *U*	20 *U*	19 *U*	19 *U*	18 *U*	20 *U*	19 *U*	20 *U*
Di-*n*-octyl phthalate	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*
Hexachlorobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Hexachlorobutadiene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Hexachlorocyclopentadiene	µg/kg	200 *U*	190 *U*	200 *U*	190 *U*	190 *U*	180 *U*	200 *U*	190 *U*	200 *U*

Table 2. (cont.)

Chemical	Units	RB1 10/10/00 SD0001 0 - 10 cm	RB2 10/10/00 SD0002 0 - 10 cm	RB3 10/10/00 SD0003 0 - 10 cm	RB4a 10/10/00 SD0004 0 - 10 cm	RB4b 10/10/00 SD0014 0 - 30 cm	RB5 10/10/00 SD0005 0 - 10 cm	RB6 10/10/00 SD0006 0 - 10 cm	RB6 (dup) 10/10/00 SD0007 0 - 10 cm	RB7 10/10/00 SD0008 0 - 10 cm
Hexachloroethane	µg/kg	40 *U*	39 *U*	40 *U*	39 *U*	39 *U*	36 *U*	40 *U*	38 *U*	40 *U*
Isophorone	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Nitrobenzene	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
N-nitroso-di-*n*-propylamine	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
N-nitrosodiphenylamine	µg/kg	9.9 *U*	9.7 *U*	9.9 *U*	9.7 *U*	9.7 *U*	8.9 *U*	10 *U*	9.6 *U*	9.9 *U*
Pentachlorophenol	µg/kg	300 *U*	290 *U*	300 *U*	290 *U*	290 *U*	270 *U*	300 *U*	290 *U*	300 *U*
Phenol	µg/kg	50 *U*	49 *U*	49 *U*	72	49 *U*	44 *U*	50 *U*	48 *U*	49 *U*

Table 2. (cont.)

Chemical	Units	RB8 10/10/00 SD0009 0 - 10 cm	RB9 10/10/00 SD0010 0 - 10 cm	RB10 10/10/00 SD0011 0 - 10 cm	RB11 10/10/00 SD0012 0 - 10 cm	RB12 10/10/00 SD0013 0 - 10 cm	RB13 10/10/00 SD0015 0 - 30 cm	RB13 10/10/00 SD0016 30 - 60 cm
Total Polycyclic Aromatic Hydrocarbons[a]		1600 *L*	250 *L*	320 *L*	200 *U*	200 *U*	220 *L*	270 *L*
Low Molecular Weight PAH[a,b]		120 *L*	68 *U*	69 *U*	69 *U*	69 *U*	67 *U*	68 *U*
2-Methylnaphthalene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Acenaphthene	µg/kg	20 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Acenaphthylene	µg/kg	12	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Anthracene	µg/kg	12	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Fluorene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Naphthalene	µg/kg	10	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Phenanthrene	µg/kg	50	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
High Molecular Weight PAH[a,c]		1500 *L*	180 *L*	250 *L*	130 *U*	130 *U*	150 *L*	200 *L*
Benz[a]anthracene	µg/kg	88	9.7 *U*	16	9.9 *U*	9.9 *U*	9.6 *U*	11
Benzo[a]pyrene	µg/kg	160	25	25	9.9 *U*	9.9 *U*	18	27
Benzo[b]fluoranthene	µg/kg	110	19	22	9.9 *U*	9.9 *U*	17	22
Benzo[ghi]perylene	µg/kg	200 *U*	23	23	20 *U*	20 *U*	19 *U*	25
Benzo[k]fluoranthene	µg/kg	110	17	20	9.9 *U*	9.9 *U*	13	21
Chrysene	µg/kg	130	18	26	9.9 *U*	9.9 *U*	16	26
Dibenz[a,h]anthracene	µg/kg	200 *U*	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
Fluoranthene	µg/kg	160	12	34	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Indeno[1,2,3-cd]pyrene	µg/kg	200 *U*	23	20 *U*	20 *U*	20 *U*	19 *U*	22
Pyrene	µg/kg	190	16	43	9.9 *U*	9.9 *U*	14	13
Miscellaneous Organic Compounds								
1,2,4-Trichlorobenzene	µg/kg	20 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
1,2-Dichlorobenzene	µg/kg	20 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
1,3-Dichlorobenzene	µg/kg	20 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
1,4-Dichlorobenzene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
2,4,5-Trichlorophenol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
2,4,6-Trichlorophenol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
2,4-Dichlorophenol	µg/kg	100 *U*	97 *U*	99 *U*	99 *U*	99 *U*	96 *U*	97 *U*
2,4-Dimethylphenol	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
2,4-Dinitrophenol	µg/kg	300 *U*	290 *U*	300 *U*	300 *U*	300 *U*	290 *U*	290 *U*
2,4-Dinitrotoluene	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*

Table 2. (cont.)

Chemical	Units	RB8 10/10/00 SD0009 0 - 10 cm	RB9 10/10/00 SD0010 0 - 10 cm	RB10 10/10/00 SD0011 0 - 10 cm	RB11 10/10/00 SD0012 0 - 10 cm	RB12 10/10/00 SD0013 0 - 10 cm	RB13 10/10/00 SD0015 0 - 30 cm	RB13 10/10/00 SD0016 30 - 60 cm
2,6-Dinitrotoluene	µg/kg	20 *U*	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
2-Chloronaphthalene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
2-Chlorophenol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
2-Methyl-4,6-dinitrophenol	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
2-Methylphenol	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
2-Nitroaniline	µg/kg	20 *U*	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
2-Nitrophenol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
3,3'-Dichlorobenzidine	µg/kg	300 *UJ*	70 *UJ*	80 *UJ*	70 *UJ*	70 *UJ*	70 *UJ*	80 *UJ*
3- and 4-Methylphenol Coelution	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
3-Nitroaniline	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
4-Bromophenyl-phenyl ether	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
4-Chloro-3-methylphenol	µg/kg	90 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
4-Chloroaniline	µg/kg	50 *UJ*	49 *UJ*	50 *UJ*	50 *UJ*	50 *UJ*	48 *UJ*	49 *UJ*
4-Chlorophenyl-phenyl ether	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
4-Nitroaniline	µg/kg	100 *U*	97 *U*	99 *U*	99 *U*	99 *U*	96 *U*	97 *U*
4-Nitrophenol	µg/kg	100 *U*	97 *U*	99 *U*	99 *U*	99 *U*	96 *U*	97 *U*
Benzoic acid	µg/kg	400 *U*	390 *U*	400 *U*	400 *U*	400 *U*	390 *U*	390 *U*
Benzyl alcohol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*
bis[2-Chloroethoxy]methane	µg/kg	20 *U*	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
bis[2-Chloroethyl]ether	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
bis[2-Chloroisopropyl]ether	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
bis[2-Ethylhexyl]phthalate	µg/kg	2,000 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
Butylbenzyl phthalate	µg/kg	34	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
Carbazole	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Dibenzofuran	µg/kg	14	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Diethyl phthalate	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Dimethyl phthalate	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Di-*n*-butyl phthalate	µg/kg	20 *U*	19 *U*	20 *U*	20 *U*	20 *U*	19 *U*	19 *U*
Di-*n*-octyl phthalate	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*
Hexachlorobenzene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Hexachlorobutadiene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Hexachlorocyclopentadiene	µg/kg	200 *U*	190 *U*	200 *U*	200 *U*	200 *U*	190 *U*	190 *U*

Table 2. (cont.)

Chemical	Units	RB8 10/10/00 SD0009 0 - 10 cm	RB9 10/10/00 SD0010 0 - 10 cm	RB10 10/10/00 SD0011 0 - 10 cm	RB11 10/10/00 SD0012 0 - 10 cm	RB12 10/10/00 SD0013 0 - 10 cm	RB13 10/10/00 SD0015 0 - 30 cm	RB13 10/10/00 SD0016 30 - 60 cm
Hexachloroethane	µg/kg	40 *U*	39 *U*	40 *U*	40 *U*	40 *U*	39 *U*	39 *U*
Isophorone	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Nitrobenzene	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
N-nitroso-di-*n*-propylamine	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
N-nitrosodiphenylamine	µg/kg	10 *U*	9.7 *U*	9.9 *U*	9.9 *U*	9.9 *U*	9.6 *U*	9.7 *U*
Pentachlorophenol	µg/kg	300 *U*	290 *U*	300 *U*	300 *U*	300 *U*	290 *U*	290 *U*
Phenol	µg/kg	50 *U*	49 *U*	50 *U*	50 *U*	50 *U*	48 *U*	49 *U*

Note: -- not analyzed

J - estimated

L - maximum concentration since the full detection limit is included for all undetected compounds.

U - undetected at detection limit shown

Bold values exceed dredged material screening values.

[a] PAH, LPAH, and HPAH results have been rounded to reflect 2 significant figures.

[b] LPAH is the sum of all low molecular weight PAH compounds shown here. If any of these compounds is undetected, the sum is assigned an *L* qualifier; if all are undetected, the sum is assigned a *U* qualifier.

[c] HPAH is the sum of all high molecular weight PAH compounds shown here. If any of these compounds is undetected, the sum is assigned an *L* qualifier; if all are undetected, the sum is assigned a *U* qualifier.

PRP Information Summary for Mar Com, Inc.

SUMMARY

Mar Com, Inc. is the current owner and operator of a land parcel located along North Bradford Street, located within and adjacent to the Harbor Initial Study Area and from which there is and has been a release of CERCLA hazardous substances. As shown in Figure 1, Mar Com is located on the eastern shore of the Willamette River at approximately river mile 6. Hazardous substances have been detected in submerged and submersible lands currently and historically owned and operated by Mar Com, including Chemicals of Potential Concern ("COPC") such as polycyclic aromatic hydrocarbons (PAHs) cadmium, chromium, zinc, nickel, lead, mercury, and arsenic (see Exhibit 1). In addition, hazardous substances including COPC are known to have been released from the Mar Com facility to the Willamette River.

1.0 LOCAL PRP CONTACT INFO

Mar Com, Inc. (ECSI #1528)
8970 North Bradford Street
Portland, Oregon 97203

1.1 CORPORATE SERVICE INFO

Same as above.

2.0 SITE(S)

Location and Area. The 15.5 acre Mar Com site is located on the east side of the Willamette River at approximately RM 6 (Figure 1). A stormwater drainage easement for the City of Portland bisects the site and divides the property into two areas, referred to as the northern (10 acres) and southern (5.5 acres) parcels (see Figure 2). The property is in an area of mixed industrial, commercial, residential, and recreational (Cathedral Park) use.

Topography. The property is located at the base of a steep hill, but the site itself is relatively flat with a gentle slope towards the river. The facility includes a floating dry dock located approximately 50 feet offshore. There are two marine ways used for pulling vessels out of the water. Stormwater outfalls on the southern parcel discharge to the river.

3.0 OWNER/OCCUPANT ACTIVITIES

Owner/Occupant	Type of Operation	Years
Mar Com, Inc. (owner)	Tug, barge and ship repair	1996 - present
C & L Sandblasting and Painting (wholly owned subsidiary of Mar Com)	Sandblasting and painting	2000 - present
Various owners and lessees	Shipyard support operations (e.g., welding, machine shop, painting, electrical contractors)	1905 - present
Erion Lumber Company, St. John Forest Products, several other owners	Sawmill	Late 1940s - 1990

Owner/Occupant	Type of Operation	Years
Portland Woolen Mills	Wool grading, baling, textile mill	~1911 – 1950s
Grant Smith-Porter Ship Co.	Shipyard	1920s – at least 1950s
St. Johns Shipbuilding	Shipyard	~1905- 1920s

4.0 Current Site Use

Mar Com has owned and operated a tug, barge, and ship repair facility at the site since 1996. The northern parcel is mostly unpaved and vacant, and is used for equipment and parts storage. The southern parcel is used by Mar Com for ship repair and shipyard support activities. Activities include steel and piping repairs, welding, machinery overhauls, high-pressure water blasting, sand blasting, painting and electrical repairs. C & L Sandblasting and Painting provides sandblasting and painting services for ship construction and vessel repair services on-site.

5.0 Historical Site Use

The primary site use has been ship construction and vessel repair since approximately 1905. Other businesses have also occupied parts of the site, including a sawmill (several owners), a woolen mill, and a variety of small maintenance and support operations (various owners). These industrial activities have occurred on the southern parcel. The northern parcel has been used for storage of mostly wood products.

The site is reported to have received dredged material from the Willamette River, including placement on-site of sediment excavated during marine way overhaul in 1987.

6.0 Regulatory Cleanup History

Following EPA's sediment investigation of Portland Harbor, DEQ identified sediment contaminants adjacent to Mar Com that were similar to those used in ship building, sandblasting, painting, and repair. Knowing runoff from the site has historically been to the river, DEQ presumed that releases to the river have occurred. In September 1999, DEQ informed Mar Com of the need for a remedial investigation. DEQ and Mar Com could not reach an agreement and in August 2000, DEQ issued a Unilateral Order requiring Mar Com to conduct a RI. DEQ subsequently determined that Mar Com was "unwilling" to conduct necessary work at the site and completed an expanded preliminary assessment through the Orphan Site Program. Mar Com reversed position and signed a Voluntary Agreement with DEQ in November 2001, and is currently conducting a RI under the Voluntary Cleanup Program.

7.0 History of Participation in the Harbor

Mar Com received the General Notice Letter on the Portland Harbor site listing from the EPA in January 2001. Mar Com also received a September 2001 notice from the LWG of finalization of the AOC and the opportunity to sign it.

8.0 Chemicals of Possible Potential Concern

Chemicals of interest in soil, grit, slag, groundwater, and sediment include TPH, PAHs, chlorinated solvents, metals (including arsenic, chromium, copper, lead, mercury and zinc) and organotins. DEQ also identified organotins as contaminants of interest in soil. PAH compounds and metals (arsenic, chromium, copper, mercury, nickel, lead, and zinc) are present at elevated levels in adjacent historical surface sediment samples. These chemicals are of concern in the Portland Harbor Superfund Site.

9.0 Potential Pathways to Willamette River

Direct release via overwater activities, surface water sheet flow, stormwater outfalls, petroleum hydrocarbon plume in groundwater likely to intersect river, chlorinated solvent plume in groundwater has potential to intersect river but has not been confirmed.

10.0 Release Events Known to Regulatory Agencies

- Petroleum-contaminated soils left in-place during decommissioning of USTs with potential impacts to adjacent river sediment
- Discharge of untreated storm water to river (Notice of Noncompliance in 1997) with impacts to adjacent river sediment
- Spent sand blasting grit with potential impacts to adjacent river sediment
- Direct releases of paint and oil-contaminated bilge water to Willamette River reported by U.S. Coast Guard with potential impacts to adjacent river sediment
- Potential spills and/or releases of oil, paints, solvents, and hazardous substances from drums, equipment operation and maintenance, former septic tank and/or drainfield, and other site activities. Contaminated surface soil removed in mid-1990s.
- Solvents and petroleum hydrocarbons detected in groundwater with potential impacts to adjacent river sediment.

11.0 Summary of Existing Sediment Chemistry Within, Adjacent to, and Downstream of the Site

EPA collected surface sediments samples adjacent to Mar Com in 1997 as part of the Portland Harbor Sediment Investigation (see Exhibit 1). Two samples were collected directly in front of the facility (SD053), one sample was collected upstream (SD056), and one sample was collected downstream (SD051). Surface samples were collected in the top 12 to 17 cm. Sediment samples were analyzed for metals, semi-volatile organic compounds, and organotins. Data were compared to two sets of freshwater criteria: NOAA's threshold effects levels (TELs) and probable effects levels (PELs) (see Buchman 1999) and the consensus-based sediment quality guidelines developed by MacDonald et al. (2000), which contains probable effects concentrations (PECs) and threshold effect concentrations (TECs). Cadmium, chromium, and zinc exceeded the

TEL and lead, mercury and nickel exceeded the TEL and PEL at one or more stations adjacent to Mar Com. Metal concentrations at the nearest downstream station were similar to those at Mar Com. PAHs at one station adjacent to Mar Com exceeded the PEC.

In 2002, three surface sediment samples (from proximately top 25 cm) were collected inshore of the mooring dolphins (see Exhibit 1). Samples were identified as SED-1, SED-2, and SED-3 from upstream to downstream. The three sediment samples were collected as part of Mar Com's Expanded Preliminary Assessment. Arsenic, chromium, copper, lead, nickel, zinc, and six PAH compounds (pyrene, fluoranthene, chrysene, benzo(a)pyrene, benzo(a)anthracene, and phenanthrene) exceeded TELs in all three samples. Arsenic, chromium, copper, lead, and zinc also exceeded PELs at stations SED-1 and SED-2. Benzo(a)anthracene was the only PAH compound to exceed the PEL (SED-2). Arsenic, chromium, copper, lead, nickel, and zinc exceeded TECs at SED-1 and SED-2, and up to 8 PAH compounds exceeded TECs at all three stations. Chromium, copper, nickel, and zinc exceeded TECs at station SED-3. Only metals exceeded PECs, including copper, nickel, and lead at both stations SED-1 and SED-2. Arsenic, chromium, and zinc also exceeded PECs at SED-2, and no PEC exceedances occurred at SED-3.

Sources of Information

Buchman, M.F. 1999. NOAA Screening Quick Reference Tables (SQuiRTs), National Oceanic Atmospheric Administration, HAZMAT, report 99-1. Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, Seattle, WA.

MacDonald, D.D., C.G. Ingersoll, T.A. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

Oregon Department of Environmental Quality. 2003. Environmental Cleanup Site Information Database Site Summary Report. Oregon Department of Environmental Quality. Portland , Oregon.

Oregon Department of Environmental Quality. 2003. Mar Com Cleanup Project Status Report. Northwest Region, Oregon Department of Environmental Quality. Portland , Oregon.

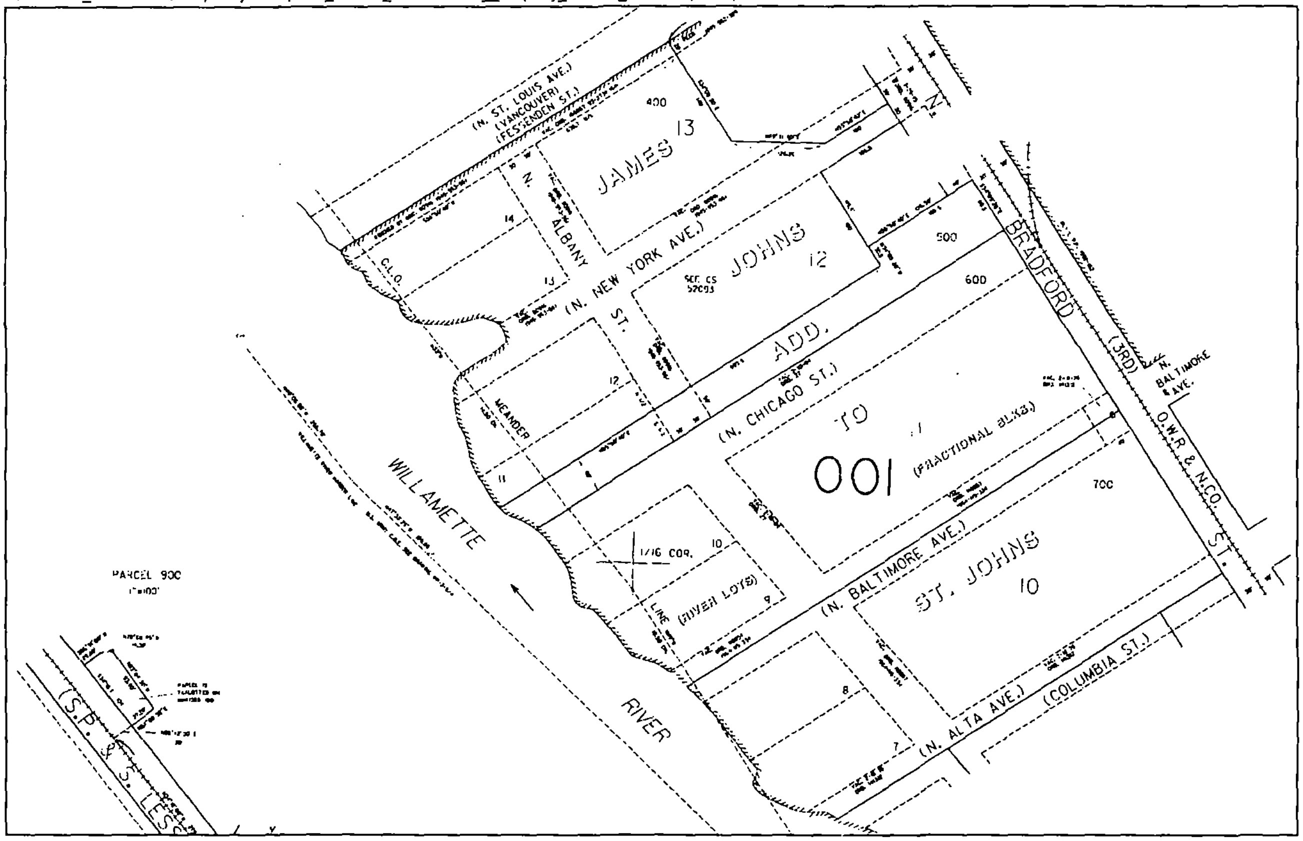
Parametrix. 2002. Expanded Preliminary Assessment Mar Com Ship Repair Facility. Prepared for Mar Com, Portland, Oregon. Prepared by Parametrix, Portland, Oregon.

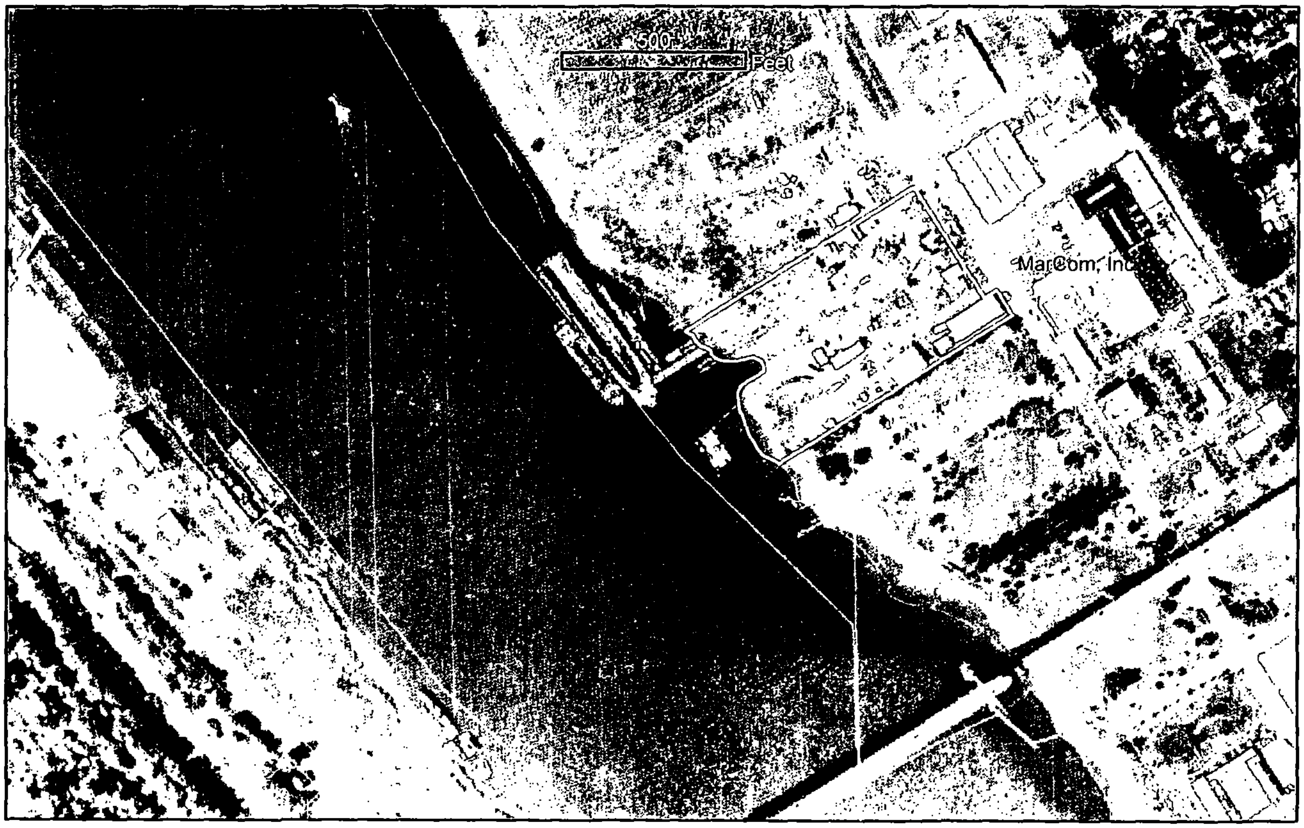
Parametrix. 2002. Draft Work Plan for Remedial Investigation. Prepared for Mar Com, Portland, Oregon. Prepared by Parametrix, Portland, Oregon.

Attachments

Figure 2
EXHIBIT 1

...Portland_Harbor\LWG-Map-Projects\Upland_Source_Task\A-sheet__Property_wPhoto_ASSRmap.mxd), Plot Date. 7/8/2003





LWG
LOWER WILLAMETTE GROUP

FEATURE SOURCES:
Taxlot features: Metro RLIS.
Channel & River mile information: ACOE
Photo Date: 2001.
Assessors Parcel Map clipp
Multnomah County online maps

Legend:
- River Miles
- Navigation Channel
- ISA boundary

Portland Harbor
PRP Information Summary
Mar Com, Inc.

Figure 2

EXHIBIT 1

Expanded Preliminary Assessment Mar Com Ship Repair Facility

Prepared for:

Mar Com

June 2002

Parametrix

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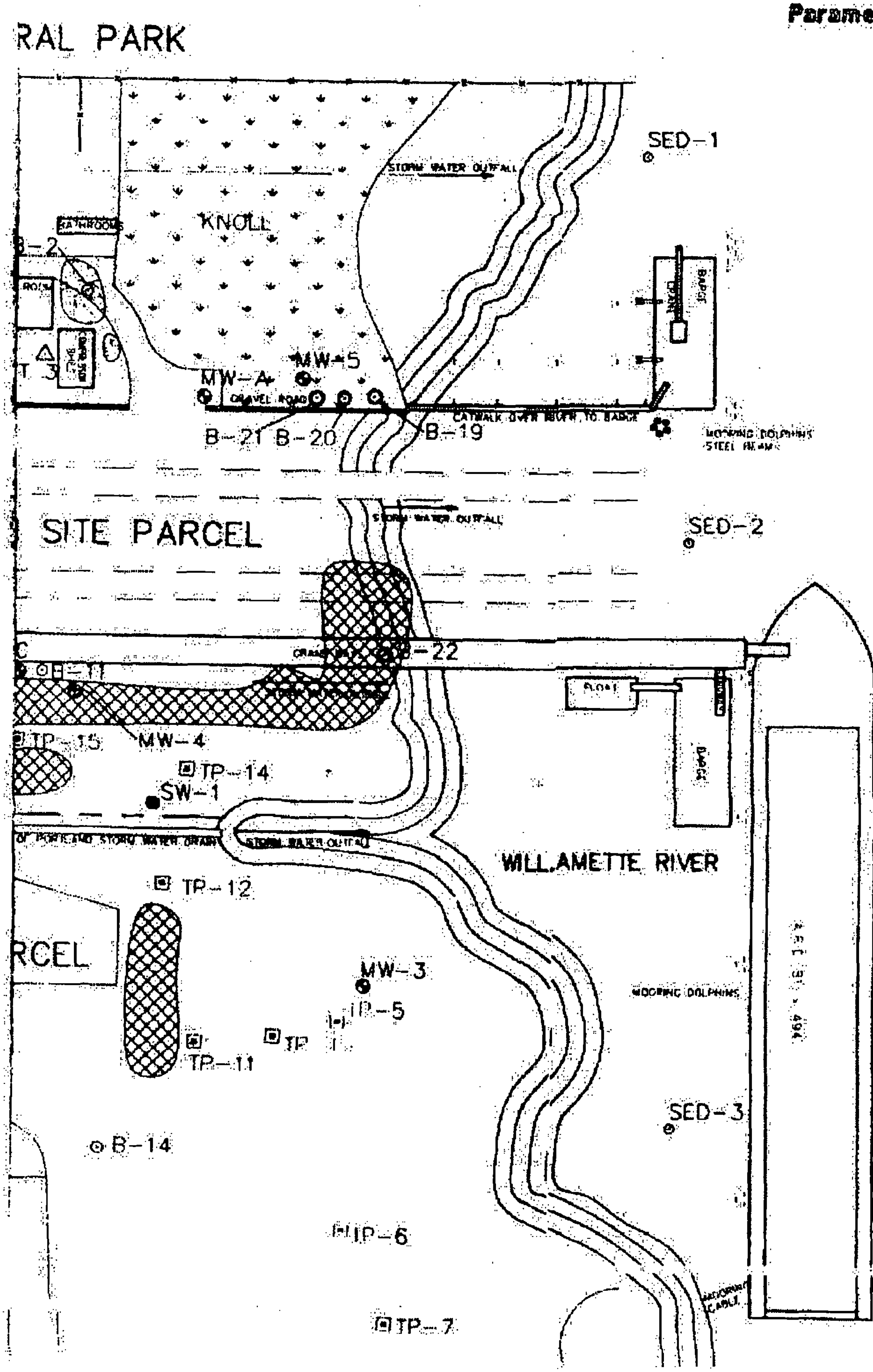
RAL PARK
SED-1
STORM WATER OUTFALL
KNOLL
BATHROOMS
B-2
MW-5
MW-A
GRAVEL ROAD
CATWALK OVER RIVER TO BARGE
B-21
B-20
B-19
MOORING DOLPHINS
STEEL BEAMS
BARGE
CRANE
SITE PARCEL
STORM WATER OUTFALL
SED-2
B-22
FLOAT
BARGE
MW-4
TP-15
TP-14
SW-1
STORM WATER OUTFALL
WILLAMETTE RIVER
TP-12
RCEL
MW-3
TP-5
TP
TP-11
MOORING DOLPHINS
SED-3
B-14
TP-6
TP-7
MOORING CABLE

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425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
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Parametrix, Inc.-(PMX) 700 NE Multnomah, Suite 1160 Portland, OR 97232	Project: Mar Com Project Number: 275-3507-002 Project Manager: Terry Belunes	Reported: 03/06/02 11:35

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
Sed-1 (P2B0273-01) Soil					Sampled: 02/08/02	Received: 02/11/02			
Aluminum	19700	39.7	mg/kg dry	10	EPA 6010A	02/20/02	02/22/02	2020621	
Arsenic	30.6	0.397	"	1	EPA 6020	"	02/21/02	"	
Barium	232	0.397	"	"	"	"	"	"	
Beryllium	0.459	0.397	"	"	"	"	"	"	
Cadmium	ND	0.397	"	"	"	"	"	"	
Calcium	53800	39.7	"	10	EPA 6010A	"	02/27/02	"	B
Chromium	109	0.397	"	1	EPA 6020	"	02/21/02	"	
Cobalt	36.7	0.397	"	"	"	"	"	"	
Copper	620	4.68	"	5.9	"	"	02/21/02	"	
Iron	84900	397	"	100	EPA 6010A	"	02/22/02	"	
Lead	577	0.397	"	1	EPA 6020	"	02/21/02	"	
Magnesium	11900	39.7	"	10	EPA 6010A	"	02/22/02	"	
Manganese	1330	3.97	"	"	"	"	"	"	
Mercury	ND	0.100	"	1	EPA 7471A	02/20/02	02/20/02	2020583	
Nickel	91.0	0.794	"	"	EPA 6020	02/20/02	02/21/02	2020621	
Potassium	52600	397	"	10	EPA 6010A	"	02/27/02	"	
Selenium	0.475	0.397	"	1	EPA 6020	"	02/21/02	"	
Silver	0.564	0.397	"	"	"	"	"	"	
Sodium	52700	1980	"	10	EPA 6010A	"	03/04/02	"	
Thallium	ND	0.397	"	1	EPA 6020	"	02/21/02	"	
Vanadium	85.0	0.397	"	"	"	"	"	"	
Zinc	388	7.94	"	"	"	"	"	"	
Sed-1 (P2B0273-01RE1) Soil					Sampled: 02/08/02	Received: 02/11/02			
Antimony	10.1	0.500	mg/kg dry	1	EPA 6020	03/01/02	03/04/02	2030023	

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210
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Parametrix, Inc.-(PMX)	Project: Mar Com	
700 NE Multnomah, Suite 1160	Project Number: 275-3507-002	Reported:
Portland, OR 97232	Project Manager: Terry Belunes	03/06/02 11:35

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
Sed-2 (P2B0273-02) Soil						Sampled: 02/08/02	Received: 02/11/02		
Aluminum	21000	41.0	mg/kg dry	10	EPA 6010A	02/20/02	02/22/02	2020621	
Arsenic	105	0.410	"	1	EPA 6020	"	02/21/02	"	
Barium	426	0.410	"	"	"	"	02/21/02	"	
Beryllium	0.665	0.410	"	"	"	"	"	"	
Cadmium	ND	0.410	"	"	"	"	"	"	
Calcium	52700	41.0	"	10	EPA 6010A	"	02/27/02	"	B
Chromium	220	0.410	"	1	EPA 6020	"	02/21/02	"	
Cobalt	55.5	0.410	"	"	"	"	"	"	
Copper	1150	4.82	"	5.88	"	"	02/21/02	"	
Iron	19100	41.0	"	10	EPA 6010A	"	02/22/02	"	
Lead	460	2.41	"	5.88	EPA 6020	"	02/21/02	"	
Magnesium	14500	41.0	"	10	EPA 6010A	"	02/22/02	"	
Manganese	1440	4.10	"	"	"	"	"	"	
Mercury	0.106	0.100	"	1	EPA 7471A	02/20/02	02/20/02	2020583	
Nickel	167	0.820	"	"	EPA 6020	02/20/02	02/21/02	2020621	
Potassium	50000	410	"	10	EPA 6010A	"	02/27/02	"	
Selenium	0.957	0.410	"	1	EPA 6020	"	02/21/02	"	
Silver	1.16	0.410	"	"	"	"	"	"	
Sodium	49000	2050	"	10	EPA 6010A	"	03/04/02	"	
Thallium	0.450	0.410	"	1	EPA 6020	"	02/21/02	"	
Vanadium	112	0.410	"	"	"	"	"	"	
Zinc	2010	48.2	"	5.88	"	"	02/21/02	"	
Sed-2 (P2B0273-02RE1) Soil						Sampled: 02/08/02	Received: 02/11/02		
Antimony	15.2	0.500	mg/kg dry	1	EPA 6020	03/01/02	03/04/02	2030023	

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509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
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Parametrix, Inc.-(PMX) 700 NE Multnomah, Suite 1160 Portland, OR 97232	Project: Mar Com Project Number: 275-3507-002 Project Manager: Terry Behmes	Reported: 03/06/02 11:35

Total Metals per EPA 6000/7000 Series Methods

North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
Sed-3 (P2B0273-03) Soil					Sampled: 02/08/02	Received: 02/11/02			
Aluminum	8470	5.00	mg/kg dry	1	EPA 6010A	02/20/02	02/22/02	2020621	
Arsenic	7.39	0.500	"	"	EPA 6020	"	02/21/02	"	
Barium	223	0.500	"	"	"	"	"	"	
Beryllium	0.869	0.500	"	"	"	"	"	"	
Cadmium	ND	0.500	"	"	"	"	"	"	
Calcium	9410	50.0	"	10	EPA 6010A	"	02/27/02	"	B
Chromium	48.4	0.500	"	1	EPA 6020	"	02/21/02	"	
Cobalt	26.0	1.00	"	2	"	"	"	"	
Copper	118	1.00	"	1	"	"	"	"	
Iron	50100	50.0	"	10	EPA 6010A	"	02/22/02	"	
Lead	35.2	0.500	"	1	EPA 6020	"	02/21/02	"	
Magnesium	6560	5.00	"	"	EPA 6010A	"	02/22/02	"	
Manganese	772	0.500	"	"	"	"	"	"	
Mercury	ND	0.100	"	"	EPA 7471A	02/20/02	02/20/02	2020583	
Nickel	38.1	1.00	"	"	EPA 6020	02/20/02	02/21/02	2020621	
Potassium	10200	500	"	10	EPA 6010A	"	02/27/02	"	
Selenium	ND	0.500	"	1	EPA 6020	"	02/21/02	"	
Silver	ND	1.00	"	2	"	"	"	"	
Sodium	10700	2500	"	10	EPA 6010A	"	03/04/02	"	
Thallium	ND	0.500	"	1	EPA 6020	"	02/21/02	"	
Vanadium	147	0.500	"	"	"	"	"	"	
Zinc	225	10.0	"	"	"	"	"	"	
Sed-3 (P2B0273-03RE1) Soil					Sampled: 02/08/02	Received: 02/11/02			
Antimony	ND	0.500	mg/kg dry	1	EPA 6020	03/01/02	03/04/02	2030023	

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Parametrix, Inc.-(PMX) 700 NE Multnomah, Suite 1160 Portland, OR 97232	Project: Mar Com Project Number: 275-3507-002 Project Manager: Terry Befunes	Reported: 03/06/02 11:35

Polynuclear Aromatic Compounds per EPA 8270M-SIM
North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
Sed-1 (P2B0273-01) Soil					Sampled: 02/08/02	Received: 02/11/02			R-05
Acenaphthene	ND	26.8	ug/kg dry	2	EPA 8270m	02/13/02	02/14/02	2020342	
Acenaphthylene	ND	26.8	"	"	"	"	"	"	
Anthracene	**70.0**	26.8	"	"	"	"	"	"	
Benzo (a) anthracene	**232**	26.8	"	"	"	"	"	"	
Benzo (a) pyrene	**236**	26.8	"	"	"	"	"	"	
Benzo (b) fluoranthene	**193**	26.8	"	"	"	"	"	"	
Benzo (ghi) perylene	**173**	26.8	"	"	"	"	"	"	
Benzo (k) fluoranthene	**215**	26.8	"	"	"	"	"	"	
Chrysene	**243**	26.8	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	**52.3**	26.8	"	"	"	"	"	"	
Fluoranthene	**369**	26.8	"	"	"	"	"	"	
Fluorene	ND	26.8	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**160**	26.8	"	"	"	"	"	"	
Naphthalene	ND	26.8	"	"	"	"	"	"	
Phenanthrene	**169**	26.8	"	"	"	"	"	"	
Pyrene	**351**	26.8	"	"	"	"	"	"	
Surr: Fluorene-d10	*82.7 %*	*40-150*							
Surr: Pyrene-d10	*99.1 %*	*40-150*							
Surr: Benzo (a) pyrene-d12	*98.2 %*	*40-150*							
Sed-2 (P2B0273-02) Soil					Sampled: 02/08/02	Received: 02/11/02			R-05
Acenaphthene	ND	26.8	ug/kg dry	2	EPA 8270m	02/13/02	02/14/02	2020342	
Acenaphthylene	**35.2**	26.8	"	"	"	"	"	"	
Anthracene	**162**	26.8	"	"	"	"	"	"	
Benzo (a) anthracene	**548**	26.8	"	"	"	"	"	"	
Benzo (a) pyrene	**525**	26.8	"	"	"	"	"	"	
Benzo (b) fluoranthene	**500**	26.8	"	"	"	"	"	"	
Benzo (ghi) perylene	**304**	26.8	"	"	"	"	"	"	
Benzo (k) fluoranthene	**504**	26.8	"	"	"	"	"	"	
Chrysene	**583**	26.8	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	**114**	26.8	"	"	"	"	"	"	
Fluoranthene	**896**	26.8	"	"	"	"	"	"	
Fluorene	**33.5**	26.8	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**315**	26.8	"	"	"	"	"	"	
Naphthalene	ND	26.8	"	"	"	"	"	"	
Phenanthrene	**438**	26.8	"	"	"	"	"	"	
Pyrene	**801**	26.8	"	"	"	"	"	"	
Surr: Fluorene-d10	*79.6 %*	*40-150*							

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Philip Nerenberg, Laboratory Manager

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www.ncalabs.com

Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Parametrix, Inc.-(PMX) 700 NE Multnomah, Suite 1160 Portland, OR 97232	Project: Mar Com Project Number: 275-3507-002 Project Manager: Terry Belunes	Reported: 03/06/02 11:35

Polynuclear Aromatic Compounds per EPA 8270M-SIM
North Creek Analytical - Portland

Analyte	Result	Reporting Limit	Units	Dilution	Method	Prepared	Analyzed	Batch	Notes
Sed-2 (P2B0273-02) Soil					Sampled: 02/08/02	Received: 02/11/02			R-05
Surr: Pyrene-d10	*95.5 %*	*40-150*							
Surr: Benzo (a) pyrene-d12	*89.7 %*	*40-150*							
Sed-3 (P2B0273-03) Soil					Sampled: 02/08/02	Received: 02/11/02			R-05
Acenaphthene	**40.3**	26.8	ug/kg dry	2	EPA 8270m	02/13/02	02/14/02	2020342	
Acenaphthylene	ND	26.8	"	"	"	"	"	"	
Anthracene	**71.0**	26.8	"	"	"	"	"	"	
Benzo (a) anthracene	**384**	26.8	"	"	"	"	"	"	
Benzo (a) pyrene	**469**	26.8	"	"	"	"	"	"	
Benzo (b) fluoranthene	**484**	26.8	"	"	"	"	"	"	
Benzo (ghi) perylene	**279**	26.8	"	"	"	"	"	"	
Benzo (k) fluoranthene	**413**	26.8	"	"	"	"	"	"	
Chrysene	**444**	26.8	"	"	"	"	"	"	
Dibenzo (a,h) anthracene	**93.1**	26.8	"	"	"	"	"	"	
Fluoranthene	**541**	26.8	"	"	"	"	"	"	
Fluorene	**27.6**	26.8	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	**262**	26.8	"	"	"	"	"	"	
Naphthalene	ND	26.8	"	"	"	"	"	"	
Phenanthrene	**254**	26.8	"	"	"	"	"	"	
Pyrene	**525**	26.8	"	"	"	"	"	"	
Surr: Fluorene-d10	*77.5 %*	*40-150*							
Surr: Pyrene-d10	*96.7 %*	*40-150*							
Surr: Benzo (a) pyrene-d12	*92.7 %*	*40-150*							

STL Seattle

Client Name	North Creek Analytical
Client ID:	P2B0273-01
Lab ID:	103926-01
Date Received:	2/12/02
Date Prepared:	2/15/02
Date Analyzed:	2/16/02
% Solids	79.66
Dilution Factor	20

Organotins by GC/MS Ion Trap Full Scan (PSEP) Protocol

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tripentyltin (surr)	148		40	150

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MDL**	**Flags**
Tetrabutyltin	ND		1.64	0.613	
Tributyltin		43.7	3.29	1.26	
Dibutyltin	ND		2.47	0.793	
Monobutyltin	ND		3.29	1.75	

STL Seattle

Client Name	North Creek Analytical
Client ID:	P2B0273-02
Lab ID:	103928-02
Date Received:	2/12/02
Date Prepared:	2/15/02
Date Analyzed:	2/16/02
% Solids	74.83
Dilution Factor	20

Organotins by GC/MS Ion Trap Full Scan (PSEP) Protocol

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tripentyltin (surr)	122		40	150

Sample results are on a dry weight basis.

Analyte	**Result (ug/kg)**	**PQL**	**MDL**	**Flags**
Tetrabutyltin	7.14	1.74	0.647	
Tributyltin	819	3.47	1.33	D10
Dibutyltin	253	2.6	0.838	
Monobutyltin	95.5	3.47	1.85	

STL Seattle

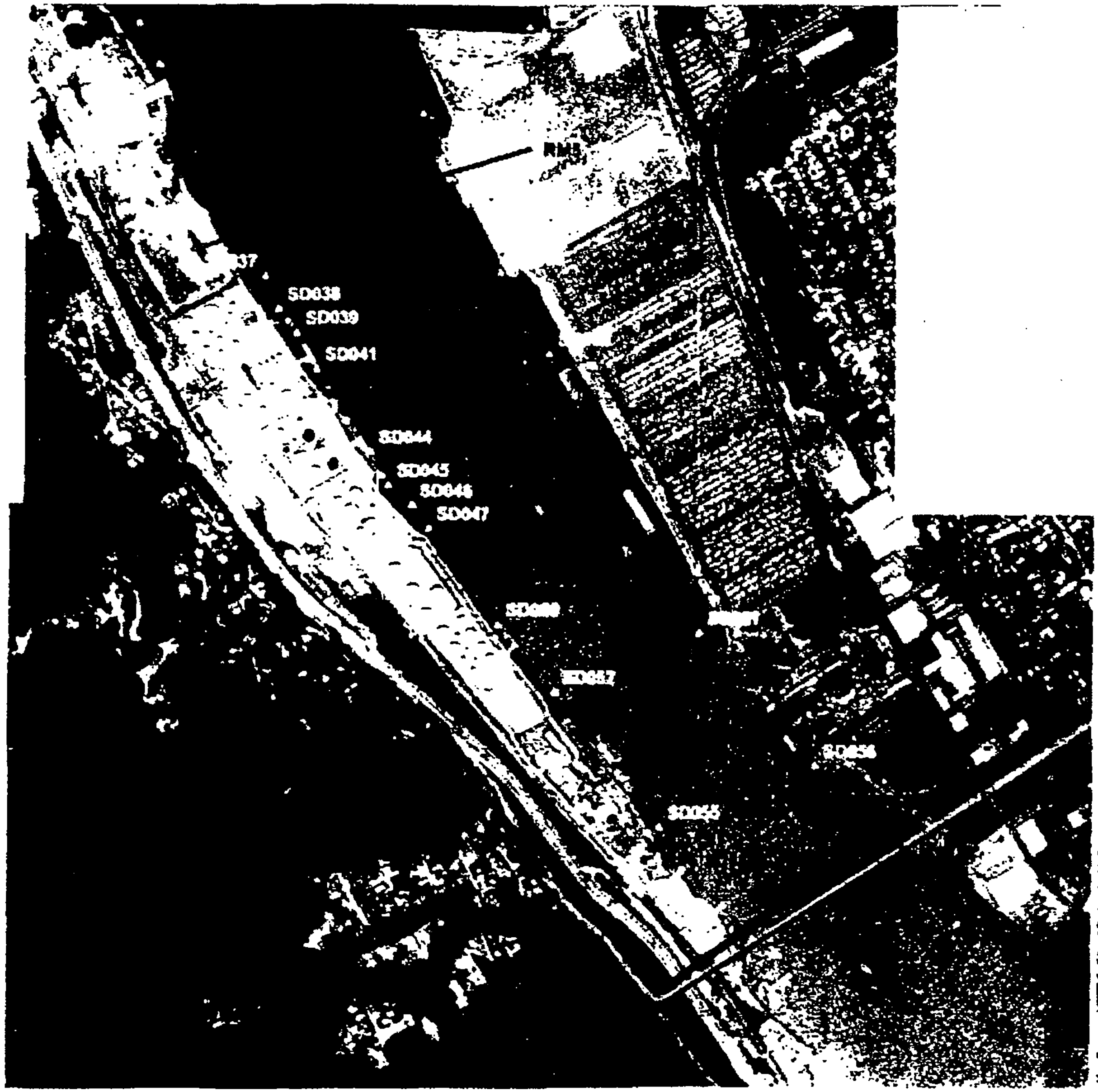
Client Name	North Creek Analytical
Client ID:	P2B0273-03
Lab ID:	103926-03
Date Received:	2/12/02
Date Prepared:	2/15/02
Date Analyzed:	2/16/02
% Solids	66.86
Dilution Factor	20

Organotins by GC/MS Ion Trap Full Scan (PSEP) Protocol

			Recovery Limits	
Surrogate	**% Recovery**	**Flags**	**Low**	**High**
Tripentyltin (surr)	161	X9	40	150

Sample results are on a dry weight basis.

Analyte		**Result (ug/kg)**	**PQL**	**MDL**	**Flags**
Tetrabutyltin	ND		2.07	0.771	
Tributyltin		117	4.14	1.59	
Dibutyltin	ND		3.1	0.998	
Monobutyltin	ND		4.14	2.2	



Portland Harbor Sediment Investigation Portland, Oregon

Surface and Subsurface Sediment Sampling Locations Between RM 5.0 and RM 6.0

EXPLANATION:

Stations

- Surface and subsurface sediments sampling location
  Surface sediment sampling location
- C Indicates core sample could not be co-located with surface sediment sampling location due to subsurface obstruction and/or insufficient recovery

Note: SD-054 was not collected due to insufficient recovery

N

500 0 500 1000 Feet

WESTON

Figure

3-2

Table 4: DEQ Sediment Sampling Summary, Willamette River, July 1997

Contaminant	Units	Downstream SD049	Downstream SD049A	Mar Com SD051	Mar Com SD053	Mar Com SD053A	Upstream SD056	Upstream SD058	Apparent Portland Harbor Sediment Baseline Maximum Value
Aluminum	mg/kg	36300	36700	34300	32100	34400	26600	22800	44000
Antimony	mg/kg	<5	NA	<5	<5	NA	<4	<4	3
Arsenic	mg/kg	<5	<5	6	<5	<8	<4	<4	3.2
Barium	mg/kg	178	175	176	167	191	149	126	198
Beryllium	mg/kg	0.6	0.61	0.6	0.54	0.6	0.46	0.39	0.7
Cadmium	mg/kg	0.3	0.4	0.5	0.4	0.6	0.5	0.3	0.7
Chromium	mg/kg	35.1	36.9	36.9	34	67.5	42.5	24.5	41
Cobalt	mg/kg	18.3	18.8	17.8	16.9	18.8	15.6	15.6	19.8
Copper	mg/kg	42.7	48.4	58	70.2	151	71.1	30	60
Iron	mg/kg	40600	40800	41100	37900	45300	35500	31700	45000
Lead	mg/kg	14	27	26	122	131	89	13	40
Manganese	mg/kg	721	704	645	603	662	528	322	780
Mercury	mg/kg	0.06	0.07	0.09	0.09	0.5	0.12	0.1	0.12
Nickel	mg/kg	29	29.7	28	28.1	37	25.6	23.8	32.5
Selenium	mg/kg	13	10	13	12	11	10	11	15
Silver	mg/kg	0.7	0.9	0.9	0.8	1.2	0.6	0.7	1.5
Thallium	mg/kg	21	9	21	21	<8	20	5	11.5
Titanium	mg/kg	1870	1950	1970	1760	1800	1730	1650	2125
Vanadium	mg/kg	100	102	101	91	84.8	84.1	79.7	112
Zinc	mg/kg	95.3	134	142	119	213	148	87.2	125
2-Methylnaphthalene	µg/kg	47	77	530	67	280	240	37	100
4-Methylphenol	µg/kg	460	54	1000	350	120	530	50	680
Benzoic Acid	µg/kg	<190	550	<190	<200	580	<190	<200	<200
Benzykl Alcohol	µg/kg	<19	<20	<19	<20	9.4	<19	<20	<20
bis(2-Ethylexyl)phthalene	µg/kg	<110	<140	220	<120	310	430	<90	20
Butybenzylphthalate	µg/kg	<19	26	37	<20	28	30	<20	<20
Carbazole	µg/kg	61	50	650	130	77	610	48	100
Di-N-Butylphthalate	µg/kg	<19	<20	<19	<20	<20	21	43	<20
Di-N-Octylphthalate	µg/kg	<19	<20	<19	<20	<20	<19	<20	<20
Dibenzofuran	µg/kg	54	160	290	57	340	220	24	100
Dimethylphthalate	µg/kg	<19	<20	<19	<20	<20	36	<20	<20
Pentachlorophenol	µg/kg	<97	<99	<97	<99	<98	88	<99	Detect
Phenol	µg/kg	<19	<20	<19	<20	26	<19	<20	<20
LPAHs (Total)	µg/kg	690	1800	2850	1014	4324	4420	379	700
HPAHs (Total)	µg/kg	1731	5682	4693	3740	9750	17300	2333	2400
DDTs (Total)	µg/kg	3.3	5.2	NA	NA	NA	NA	4.1	20
PCBs (Total)	µg/kg	<38	30	NA	NA	NA	NA	<40	<180
Organotins (Total)	µg/kg	120	213.3	28	233	1145	549	90	300
2,4-D	µg/kg	NA	NA	NA	NA	NA	NA	NA	<3.3
2,4-DB	µg/kg	NA	NA	NA	NA	NA	NA	NA	<5
TOC	%	1.2	1.8	1.5	1	1.6	1	2.6	1.75
Water Depth	Ft	41	40	31	31	38	20	45	
Sediment Sample Depth	cm	0-17	114-168	0-12	0-17	91-168	0-13	0-12	
Sediment Sample Depth	in	0-6.5	4.88-66.14	0-4.72	0-6.5	35.82-66.14	0-5.11	0-4.72	

PRP Information Summary for ARCO

SUMMARY

ARCO Products Company (ARCO), as the legal successor to the Atlantic Richfield Company, is the owner and operator of land parcels comprising BP Terminal 22T, located within and adjacent to the Harbor Initial Study Area, from which there is and has been a release of hazardous substances. ARCO is a subsidiary of British Petroleum. As shown in Figure 1, BP Terminal 22T is located on the western shore of the Willamette River at approximately river mile 5.2. Hazardous substances have been detected in submerged and submersible lands currently and historically owned and operated by ARCO, including Chemicals of Potential Concern ("COPC") such as arsenic, cadmium, chromium, copper, lead, benzene, ethylbenzene, toluene, xylene, and Polycyclic Aromatic Hydrocarbons (PAHs) (see Exhibit 1). In addition, hazardous substances including COPC are known to have been released from the BP Terminal 22T to the Willamette River.

1.0 LOCAL PRP CONTACT INFO

Atlantic Richfield Company (ARCO) BP Terminal 22T (ECSI #1528)
9930 NW St. Helens Road
Portland, Oregon 97231

1.1 CORPORATE SERVICE INFO

BP Products West Coast LLC	Atlantic Richfield Company
P.O. Box 512485	6 Centerpoint Drive, Suite 727
Los Angeles, CA 90051-0485	La Palma, CA 90623

2.0 SITE(S)

Location and Area. The ARCO terminal is located on the western shore of the Willamette River at approximately river mile 5.2 (see Figure 1). The 19-acre site includes multiple tax lots and parcels and is bisected by railroad tracks and NW Linnton Lane (see Figure 2).

The ARCO terminal consists of an operating bulk fuel storage terminal with 26 above-ground storage tanks (containing gasoline, diesel, lube oil and additives) located in three tank farm areas, as well as a warehouse, office and shop buildings, and a truck loading facility. The site also includes a wharf on the Willamette River with an associated building. The three tank farms are surrounded with dike walls. An 800-foot concrete seawall is located along the river.

Topography. The site is generally flat with a slightly upward slope to the west, toward NW St. Helens Road. With the exception of rail spur areas and exposed areas within the tank farm, the terminal surface is covered with buildings, asphalt, gravel or concrete. The lubricating oil tank farm is paved.

3.0 OWNER/OCCUPANT ACTIVITIES

Parcel	Owner/Occupant	Type of Operation	Years
Parcel A	Richfield Oil/ARCO/BP	Petroleum storage and distribution	1926 - present
Parcel B	Richfield Oil/ARCO/BP	Petroleum storage and distribution	1939 – present
	Signal Oil and Gas Co.	Petroleum storage and distribution	unknown - 1939
	Liberty Petroleum Co.	Petroleum storage and distribution	unknown
Parcel C	Richfield Oil/ARCO/BP	No petroleum storage or dist. on this parcel	1956 - present
	Various individuals	residential	Unknown - 1956
Parcel D	Richfield Oil/ARCO/BP	No petroleum storage or dist. on this parcel	1967 - present
	State of Oregon	Not reported	Unknown - 1967
	Mobil Oil (lessee)	Warehouse	Unknown - 1967

4.0 Current Site Use

The ARCO terminal receives, stores, blends, and transfers petroleum products. Petroleum products are delivered to the site via marine vessels, railroad tank cars, and pipeline. Products are distributed by marine vessels, tank cars and trucks, and pipeline. There is no manufacturing or refining at this facility.

The north tank farm consists of 11 tanks that may contain gasoline. The south tank farm consists of 8 tanks of various sizes and may contain diesels. The lube oil tank farm has 7 tanks (capacities not reported).

The ARCO facility is designated a large-quantity generator under RCRA for storage and transport of hazardous waste. A listing of these wastes was not available based on the EPA's Envirofacts database on hazardous wastes stored at the facility.

5.0 Historical Site Use

At least portions of the property have been used for petroleum storage and distribution since approximately 1932. Photographs from the 1940s show the site as a petroleum storage terminal with both the northern and southern tank farms and office buildings in their present locations. Storage capacity at the terminal has increased over time, which includes the addition of a lube oil tank farm prior to 1969.

6.0 Regulatory Cleanup History

DEQ's ECSI summary states that during the 1960s and 1970s there were a number of complaints about seepage or discharge of petroleum into the Willamette River adjacent to ARCO. ARCO entered into a Voluntary Cleanup Program (VCP) Agreement with DEQ in June 2000 for a Remedial Investigation (RI). The final RI report, which included human health and ecological risk assessments, was submitted to DEQ on October 3, 2002. Additional source control measures to provide better capture and removal of liquid-phase hydrocarbons were proposed in September 2002 (URS 2002).

7.0 History of Participation in the Harbor

ARCO received the General Notice Letter on the Portland Harbor site listing from the EPA in January 2001. ARCO attended PRP group formation meetings in 2001.

8.0 Chemicals of Possible Potential Concern

DEQ identified petroleum products and their constituents, PAHs, benzene, ethylbenzene, toluene, xylene, arsenic, cadmium, chromium, copper, and lead as contaminants potentially associated with the site (DEQ 2001, 2002). The RI ecological risk assessment screening (SECOR 2002) identified the following chemicals of potential ecological concern based on exceeding the screening levels values in surface water and sediment: benzene, toluene, ethylbenzene, isopropylbenzene, n-propylbenzene, eleven PAHs, dissolved barium and lead, and total arsenic, chromium, copper, lead, mercury, nickel and zinc. Chemicals of interest in groundwater include TPH, PAHs, BTEX, arsenic, cadmium, chromium, copper and lead. PAH compounds and metals (arsenic, chromium, copper, nickel) are present at elevated levels in adjacent historical surface sediment samples. These chemicals are of concern in the Portland Harbor Superfund Site.

9.0 Potential Pathways to Willamette River

Potential pathways include direct releases to the river during fuel transfer activities at the dock, spills, and leaking pipelines and tanks. The outfalls, including stormwater discharge, may also be potential historic pathways to the river. A petroleum hydrocarbon groundwater plume is confirmed to intersect the river, including LNAPL seepage.

10.0 Release Events Known to Regulatory Agencies

- Two NPDES permits: one for stormwater and one for treated water. Stormwater is currently collected and transported to an activated carbon treatment system or to an oil/water separator. These systems were constructed in the late 1960s or early 1970s to address reports of a petroleum sheen on the Willamette River associated with storm events. Both discharge to the Willamette River under NPDES general permit 1500A.
- Process water is collected from draining storage tank water, truck-loading rack, rail car offloading area and marine dock operations. The process water is routed through an oil-water separator and activated carbon treatment system. The treated water is discharged to the City of Portland sewer system.
- During historical operations, periodic releases of product occurred from underground pipelines, tanks, and during product transfer. Most notably, there was a documented diesel pipeline leak in July 1991; approximately 750 gallons of product were recovered.
- Free product has been documented in onsite groundwater wells since 1993. Between 1940 and 1956, ARCO installed a concrete seawall along the shoreline to, at least in part, prevent ongoing LNAPL seepage to the river. In 1971, ARCO installed a groundwater interceptor trench and wells along the base of this wall to extract free product from groundwater before it entered the river. This system is still in operation at present although anecdotal information indicates periodic LNAPL seepage to the river has recently resumed through a crack that has formed in the seawall.
- LNAPL thickness was measured up to approximately 10 ft (SECOR 2002) with documented seepage to the river.

- Petroleum fuel released at the site has impacted fine-grained native soils and channel fill deposits (SECOR 2002). Diesel and gasoline range TPH are present in soils at depths up to 30 ft. VOCs detected in soil are primarily constituents of diesel fuel.
- Some site soils contain elevated levels of arsenic and lead.

11.0 Summary of Existing Sediment Chemistry Within, Adjacent to and Downstream of the Site

EPA collected surface sediments samples adjacent to ARCO in 1997 as part of the Portland Harbor Sediment Investigation (see Exhibit 1). Stations spanned the length of the property in line with the dock. Stations were identified as SD041, SD039, SD038, and SD037 from the upstream end to the downstream end of the property. Sediment samples were analyzed for metals, semi-volatile organic compounds, and organotins. Data were compared to two sets of freshwater criteria: NOAA's threshold effects levels (TELs) and probable effects levels (PELs) (see Buchman 1999) and the consensus-based sediment quality guidelines developed by MacDonald et al. (2000), which contains probable effects concentrations (PECs) and threshold effect concentrations (TECs). Nickel, copper, and six PAH compounds exceeded the TEL at all four stations. Arsenic and chromium were also measured above the TEL at stations SD038 and SD037. PAHs were measured above the PEL at stations SD041 and SD039 adjacent to ARCO. Ten PAH compounds at station SD041 exceeded the PEC, and nickel, copper, and several PAH compounds exceeded the TEC at all four stations.

In 1999, prior to the implementation of the voluntary cleanup agreement between ARCO and DEQ, ARCO collected 15 surface sediment samples along five transects perpendicular to ARCO's shoreline (see Exhibit 1). The testing was performed to confirm the results of EPA's 1997 study and to evaluate the sources of PAH compounds. Samples were analyzed for total metals, simultaneously extractable metals, acid volatile sulfides, total organic carbon, grain size distribution, volatile organic compounds, and PAHs. Testing results confirmed EPA's study results. Cadmium, copper, mercury, and nickel exceeded TELs most frequently among metals. Each sample had at least 3 metals exceeding TELs, including a source sample identified as "Sheen". Arsenic and lead also exceeded TELs in sample SD039C. PAH compounds, including phenanthrene, fluoranthene, pyrene, benz(a)anthracene, chrysene, and benzo(a)pyrene, exceeded TELs at all but one station (SD038C). PAHs were measured above PELs at stations SD037B, SD038A, SD039B, SD039C, SD041B, SD041C, SD22TB, SD22TC, and Sheen although stations SD039C, SD041C, and SD22TC had the most PAH PEL exceedances among samples. Mercury and zinc also exceeded PELs at station SD039C. PAH compounds at 5 stations (SD039C, SD041B, SD041C, SD22TC, and Sheen) exceeded PEC values. Zinc also exceeded the PEC at station SD039C. Exceedances of TECs most frequently included cadmium, copper, mercury, nickel, and PAH compounds at most stations. Lead (SD039C), zinc (SD039C, SD22TC, SD22TC), and chromium (SD22TB) also exceeded TECs.

Sources of Information

Buchman, M.F. 1999. NOAA Screening Quick Reference Tables (SQuiRTs), National Oceanic Atmospheric Administration, HAZMAT, report 99-1. Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, Seattle, WA.

DEQ. 2001. Annual Status Report, ARCO Facility. Northwest Region Site Response Program, Oregon DEQ. Portland, OR.

DEQ. 2002. DEQ Site Summary Report – Details for Site ID 1528. DEQ Environmental Cleanup Site (ECSI) Database. November 27, 2002. www.deq.state.or.us/wmc/ecsi/ecsidetail.asp?seqnbr=1528.

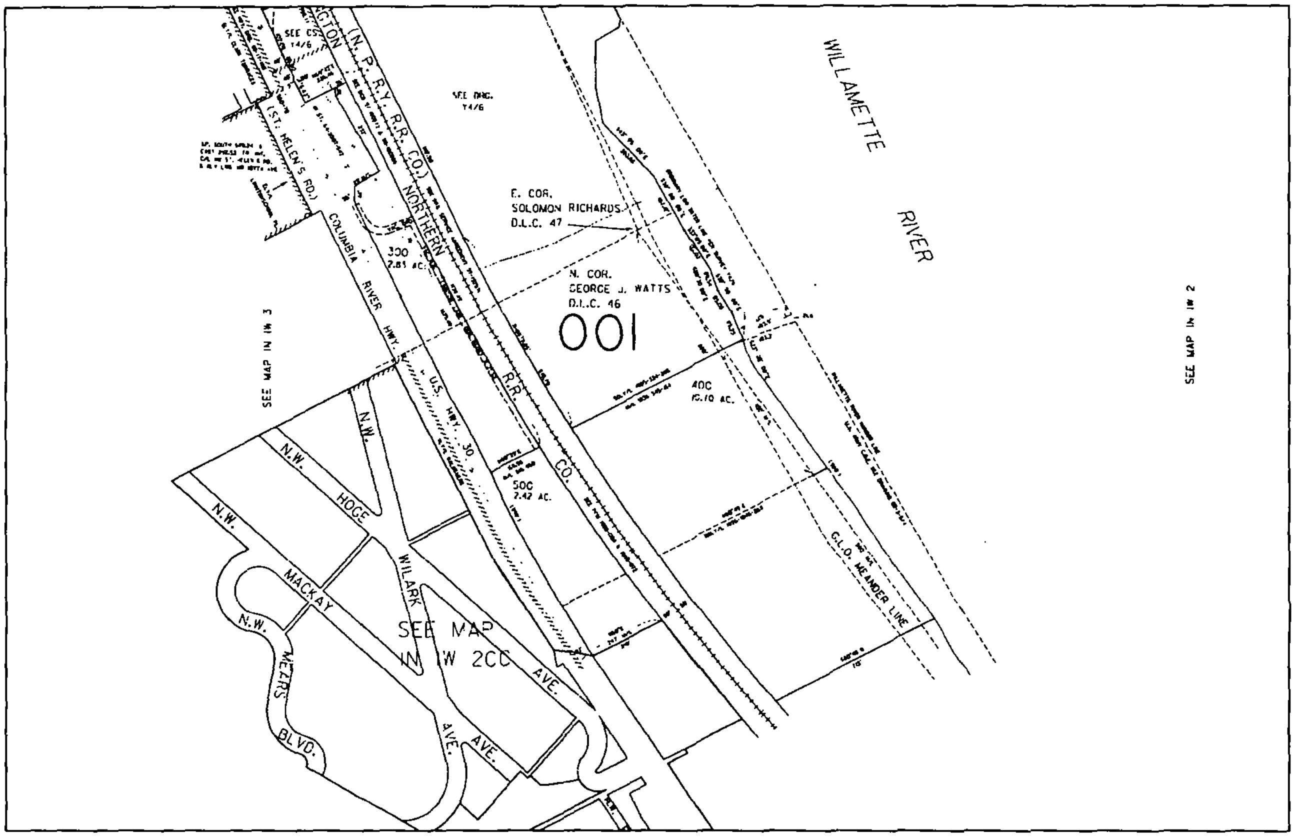
DEQ. 2002. Project Status Report, ARCO Terminal 22T. Northwest Region Voluntary Cleanup/Portland Harbor, Oregon DEQ. Portland, OR.

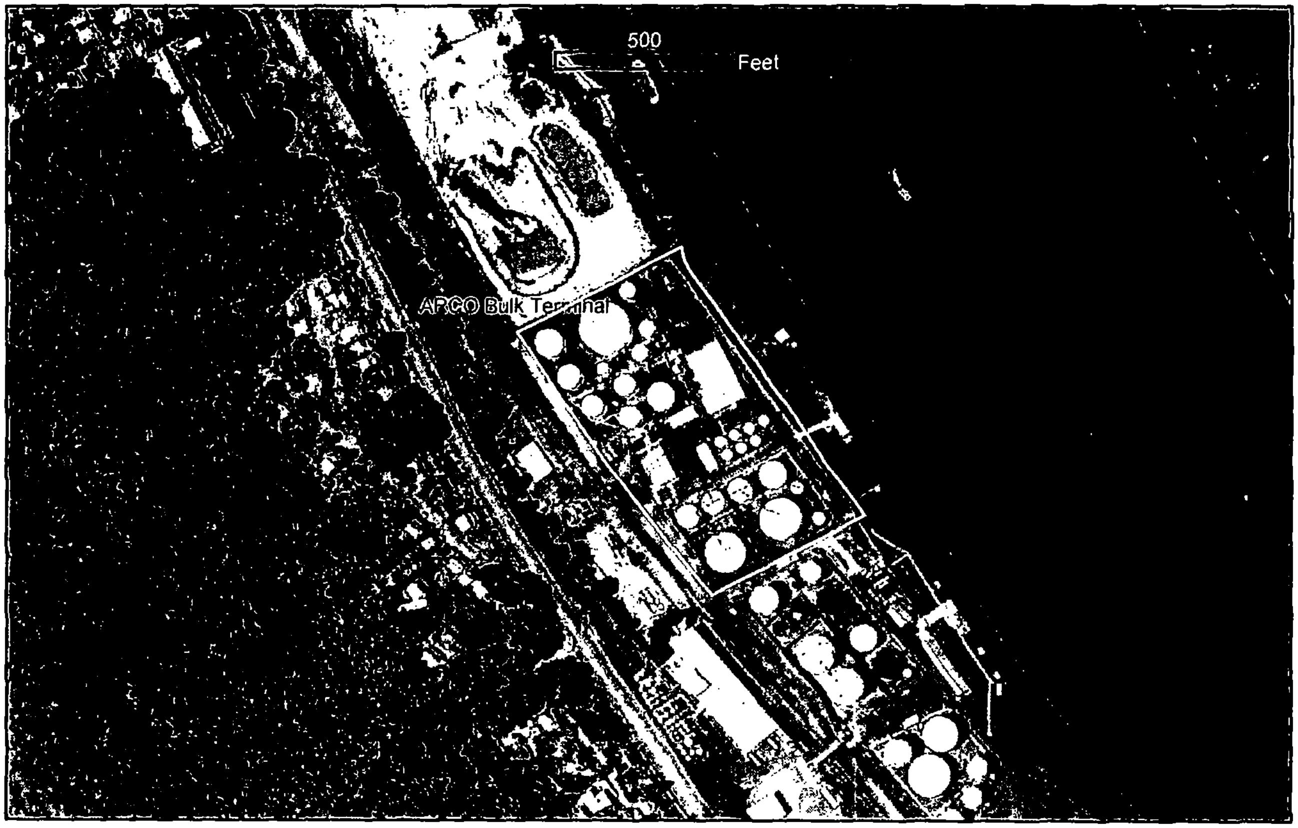
MacDonald, D.D., C.G. Ingersoll, T.A. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Arch. Environ. Contam. Toxicol. 39:20-31.

SECOR. 2002. Final Remedial Investigation Report. October 3, 2002. Prepared for Atlantic Richfield Company, La Palma, California. Prepared by SECOR International Inc., Tualatin, Oregon.

URS. 2002. Draft Scoping Document for Source Control Measures. September 11, 2002. Prepared for BP, La Palma, California. Prepared by URS Corp., Portland, Oregon.

Attachments
Figure 2
EXHIBIT 1





LWG Lower Willamette Group

FEATURE SOURCES:
Taxlot features: Metro RLIS.
Channel & River mile information, ACOE.
Photo Date: 2001
Assessors Parcel Map clipp.
Multnomah County online maps

Legend:
- River Miles
- Navigation Channel
- ISA boundary

Portland Harbor
PRP Information Summary
ARCO Bulk Terminal

Figure 2

EXHIBIT 1

FINAL
REMEDIAL INVESTIGATION REPORT
VOLUME II

Atlantic Richfield Company
BP Terminal 22 T
9930 NW St. Helens Road
Portland, Oregon

SECOR PN: 15BP.0022T.01.0246

SUBMITTED BY
SECOR International Incorporated

For

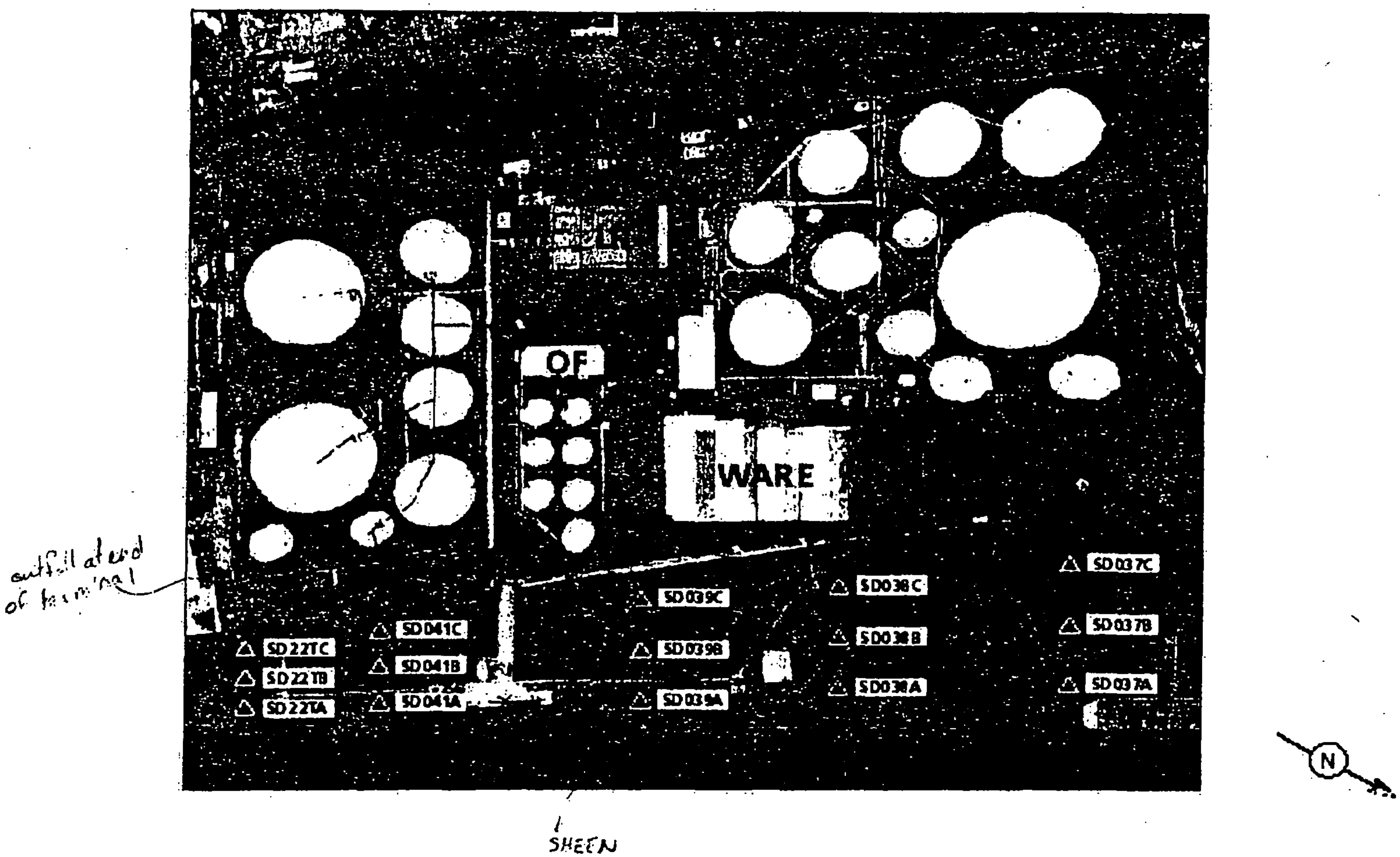
Atlantic Richfield Company
4 Center Pointe Drive
La Palma, California 90623-1066

October 3, 2002

rif_id = ARC0001
survey = wLCAR199

APPENDIX C
FORENSIC GEOCHEMICAL ASSESSMENT OF NEAR SHORE SEDIMENTS

Remedial Investigation Work Plan
Atlantic Richfield/BP Terminal 22T
Portland, Oregon
SECOR PN: 15BP.0022T.01.0246
October 3, 2002



ARCADIS
GERAGHTY&MILLER

DRAFT
PROPOSED SURFACE SEDIMENT SAMPLING LOCATIONS
ARCO Terminal 22T
Portland, Oregon

JB000624.0002
FIGURE

Figure 2

Table 2 Surface Sediment Data, September 1999 Sampling Event
ARCO Terminal 22T
Portland, Oregon

Station ID:	SD037A	SD037B	SD037C	SD038A	SD038B	SD038C	SD039A	SD039B
Depth (cm bgs):	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm
Simultaneously Extractable								
Metals (mg/Kg dry wt.)								
Cadmium	<0.1	NA	NA	NA	NA	<0.2	NA	0.2
Copper	31.8	NA	NA	NA	NA	79.6	NA	14.1
Lead	11	NA	NA	NA	NA	29.3	NA	13
Mercury	<0.02	NA	NA	NA	NA	<0.02	NA	<0.02
Nickel	16.1	NA	NA	NA	NA	16	NA	20.4
Zinc	70.8	NA	NA	NA	NA	120	NA	63.8
Total Solids (%)	43.3	73.8	93.9	43.4	58.1	94.3	47.0	55.7
Sulfide (Acid-V) (mg/Kg dry wt.)	<1.1	NA	NA	NA	NA	0.7	NA	<0.9
TOC (%)	1.85	0.57	0.16	2.24	1.35	0.15	2.19	1.12
Clay (%)	6.1	1.67	0.22	7.97	3.64	0.03	8.97	2.73
Silt (%)	70.8	2.51	2.21	55.7	56.8	0.12	79	42.2
Very Fine Sand (%)	7.89	3.89	0.41	4.1	8.74	0.02	6.21	18.7
Fine Sand (%)	8.37	30.8	5.22	8.3	18.1	1.71	4.42	22.7
Medium Sand (%)	2.01	13.4	55.5	7.06	6.79	32.7	0.25	1.05
Coarse Sand (%)	0.86	11.4	31	4.95	1.18	33.3	0.19	1.82
Very Coarse Sand (%)	0.32	9.43	4.91	3.45	0.74	8.36	0.14	0.84
Fine Gravel (%)	0	10.6	1.58	1.1	0.76	5.93	0	0.14
Medium Gravel (%)	0	16.8	0	0	0	6.69	0	0.29

Sampling Location (continued)

Station ID:	SD039C	SD041A	SD041B	SD041C	SD041A(D)	SD22TA	SD22TB	SD22TC	SHEEN[1]	METHOD BLANK	22TR[2]
Depth (cm bgs):	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm			
Simultaneously Extractable											
Metals (mg/Kg dry wt.)											
Cadmium	NA	NA	0.2	NA	NA	NA	NA	<1	0.4	<0.2	NA
Copper	NA	NA	28.7	NA	NA	NA	NA	17	71.6	<0.4	NA
Lead	NA	NA	12	NA	NA	NA	NA	25	37	<2	NA
Mercury	NA	NA	<0.02	NA	NA	NA	NA	<0.02	<0.02	<0.02	NA
Nickel	NA	NA	15.1	NA	NA	NA	NA	8	12.9	<0.8	NA
Zinc	NA	NA	71.5	NA	NA	NA	NA	111	129	<0.4	NA
Total Solids (%)	77.0	50.4	49.7	60.0	49.0	50.1	70.6	71.9	65.7	NA	NA
Sulfide (Acid-V) (mg/Kg dry wt.)	NA	NA	10.6	NA	NA	NA	NA	1.6	6.3	<0.5	NA
TOC (%)	2.32	1.65	1.45	2.21	1.69	1.39	1.06	0.57	3.43	<0.05	NA
Clay (%)	1.19	6.23	7.83	6.83	4.1	7.91	1.01	0.34	NA	NA	NA
Silt (%)	9.17	66.3	57.3	51.7	72.4	67.1	6.28	1.45	NA	NA	NA
Very Fine Sand (%)	2.06	11.3	13.7	1.19	9.24	10.9	1.12	0.78	NA	NA	NA
Fine Sand (%)	3.54	9.58	14.8	11.9	7.49	8.53	5.16	1.94	NA	NA	NA
Medium Sand (%)	18.6	2.82	0.08	16.7	2.63	2.1	5.1	5.85	NA	NA	NA
Coarse Sand (%)	20.3	0.27	0.28	6.83	1.32	0.86	8.13	16.9	NA	NA	NA
Very Coarse Sand (%)	6.27	0.3	0.19	7.62	0.68	0.27	12.9	28.8	NA	NA	NA
Fine Gravel (%)	5.97	0.13	0	11.5	0	0.37	18	18.9	NA	NA	NA
Medium Gravel (%)	27.8	0	0	13.3	0	0	42.3	24.1	NA	NA	NA

Notes:

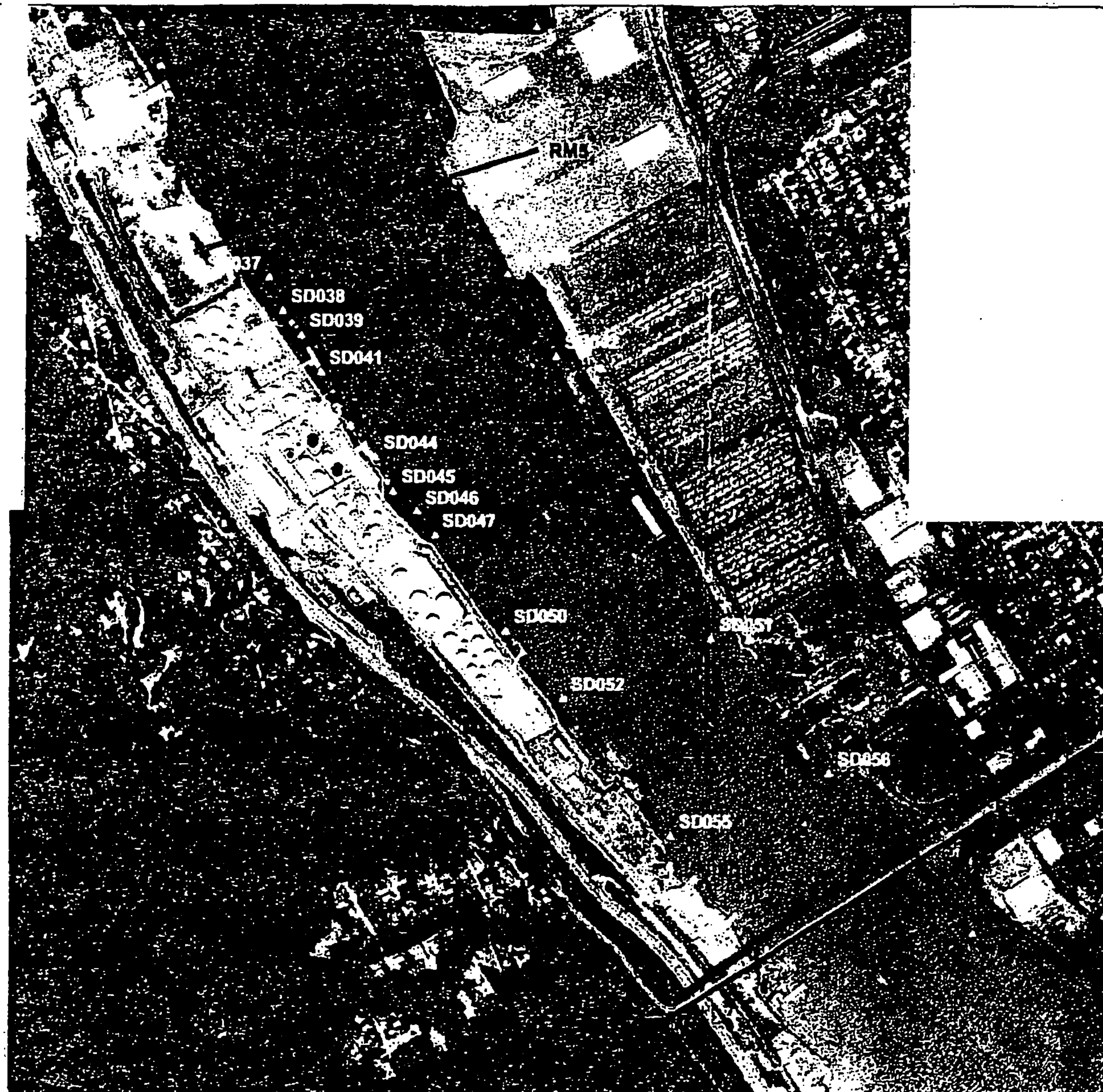
1) Sheen sediment sample was collected from the surface sediment (0 to 10 cm) in the vicinity of sample location SD039C where an oil sheen was visible on the sediment surface.

2) 22TR is an equipment rinsate sample that was collected following sample collection at transect 22T.

Table 2

Surface Sediment Data September 1999 Sampling Event
ARCO Terminal 22T
Portland, Oregon

Station ID:	Sampling Location																		
Station ID:	SD437A	SD437B	SD437C	SD438A	SD438B	SD438C	SD439A	SD439B	SD439C	SD441A	SD441B	SD441C	SD441A(D)	SD22TA	SD22TB	SD22TC	SHEEN[4]	METHOD BLANK	22TK[3]
Depth (cm bgs):	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm	0.0 to 10 cm			
[illegible]																			
Benzene	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.1	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.5
Toluene	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<1
Ethylbenzene	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<1
Xylenes	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<1
[illegible]																			
Naphthalene	0.012	0.006	<0.005	0.046	0.045	<0.005	0.014	0.11	0.097	0.058	0.04165	0.072	0.016	0.014	<0.005	0.01	0.058	<0.005	<0.02
2 Methylnaphthalene	0.006	<0.005	<0.005	0.02	0.022	<0.005	0.008	0.083	<0.005	0.024	0.030	0.035	0.009	0.01	<0.005	<0.005	0.05	<0.005	<0.02
1 Methylnaphthalene	<0.005	<0.005	<0.005	0.013	0.015	<0.005	<0.005	0.037	<0.005	0.016	0.047	0.027	0.008	0.001	<0.005	<0.005	0.068	<0.005	<0.02
C2-Naphthalenes	0.018	0.008	<0.005	0.052	0.037	<0.005	0.016	0.078	0.84	0.022	0.13	0.047	0.016	0.019	0.026	0.037	0.52	<0.005	<0.02
C3-Naphthalenes	0.018	0.009	<0.005	0.33	0.034	<0.005	0.019	0.078	9.0	0.036	0.14	0.053	0.015	0.021	0.022	0.073	1.1	<0.005	<0.02
C4-Naphthalenes	0.014	0.011	<0.005	0.29	0.027	<0.005	0.014	0.057	18	0.035	0.048	0.029	0.009	0.013	0.010	0.053	0.74	<0.005	<0.02
Acenaphthylene	0.017	0.034	<0.005	0.044	0.045	<0.005	0.011	0.045	<0.005	0.044	0.031	0.11	0.009	0.02	0.015	0.14	0.091	<0.005	<0.02
Acenaphthene	0.013	0.006	<0.005	0.046	0.030	<0.005	0.013	0.057	0.22	0.028	0.25	0.068	0.05	0.025	0.017	0.013	0.53	<0.005	<0.02
Dibenzofuran	<0.005	<0.005	<0.005	0.01	0.010	<0.005	<0.005	0.025	<0.005	0.008	0.097	0.021	0.031	0.008	0.009	<0.005	0.13	<0.005	<0.02
Fluorene	0.012	0.008	<0.005	0.036	0.026	<0.005	0.014	0.082	0.14	0.024	0.23	0.068	0.046	0.02	0.023	0.035	0.59	<0.005	<0.02
C1 Fluorenes	0.009	0.007	<0.005	0.12	0.017	<0.005	0.009	0.026	1.3	0.023	0.063	0.033	0.007	0.009	0.015	0.033	0.29	<0.005	<0.02
C2 Fluorenes	0.008	<0.005	<0.005	0.17	0.019	<0.005	0.01	0.03	4.4	0.034	0.037	<0.005	<0.005	0.009	<0.005	0.039	0.31	<0.005	<0.02
C3-Fluorenes	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.02
Dibenzothiophene	0.009	0.008	<0.005	0.074	0.027	<0.005	0.009	0.058	<0.005	0.034	0.09	0.068	0.01	0.012	0.022	0.097	0.15	<0.005	<0.01
C1 Dibenzothiophenes	<0.005	<0.005	<0.005	0.12	0.007	<0.005	<0.005	0.02	7.4	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	0.27	<0.005	<0.02
C2 Dibenzothiophenes	0.009	0.011	<0.005	0.1	0.0226	<0.005	0.011	0.031	1.6	0.039	0.034	0.046	<0.005	<0.005	0.009	0.081	0.19	<0.005	<0.02
C3-Dibenzothiophenes	0.007	<0.005	<0.005	0.087	0.03	<0.005	0.013	0.036	1.1	0.021	0.02	0.045	<0.005	<0.005	<0.005	0.044	0.13	<0.005	<0.02
Phenanthrene	0.092	0.095	0.044	0.36	0.28	0.007	0.11	0.37	0.38	0.34	1.2	0.82	0.098	0.12	0.3	1.1	1.2	<0.005	<0.02
Anthracene	0.027	0.03	0.005	0.070	0.072	<0.005	0.031	0.11	0.29	0.086	0.23	0.17	0.022	0.033	0.057	0.25	0.39	<0.005	<0.01
C1 Phenanthrenes/Anthracenes	0.044	0.07	0.014	0.27	0.13	<0.005	0.046	0.15	1.7	0.15	0.28	0.26	0.05	0.051	0.063	0.4	0.44	<0.005	<0.01
C2 Phenanthrenes/Anthracenes	0.041	0.063	0.011	0.29	0.096	<0.005	0.079	0.12	6.0	0.1	0.14	0.15	0.029	0.040	0.034	0.23	0.43	<0.005	<0.02
C3-Phenanthrenes/Anthracenes	0.019	0.03	<0.005	0.19	0.069	<0.005	0.017	0.079	4.2	0.075	0.059	0.087	0.016	0.017	0.017	0.099	0.4	<0.005	<0.02
C4-Phenanthrenes/Anthracenes	<0.005	<0.005	<0.005	0.056	<0.005	<0.005	<0.005	<0.005	1.5	<0.025	<0.005	0.019	<0.005	<0.005	<0.005	0.024	<0.005	<0.005	<0.02
Fluoranthene	0.22	1.0	0.19	1.0	0.75	0.016	0.27	1.0	1.7	0.66	0.97	2.5	0.16	0.26	0.91	3.2	2.8	<0.005	<0.02
Pyrene	0.19	0.69	0.12	1.1	0.66	0.014	0.24	0.82	7.8	0.59	0.71	2.9	0.15	0.25	0.66	6.2	2.6	<0.005	<0.02
C1 Fluoranthenes/Pyrenes	0.08	0.33	0.030	0.35	0.22	<0.005	0.083	0.23		0.16	0.21	0.47	0.055	0.082	0.2	0.75	0.63	<0.005	<0.02
Benz(a)anthracene	0.13	0.68	0.068	0.4	0.54	0.013	0.14	0.42	2.4	0.24	0.34	0.99	0.078	0.13	0.49	2.2	1.1	<0.005	<0.02
Chrysene	0.16	0.65	0.099	0.45	0.48	0.021	0.14	0.46	2.8	0.24	0.29	1.1	0.087	0.15	0.53	2.8	1.2	<0.005	<0.02
C1-Chrysenes	0.078	0.30	0.025	0.24	0.2	<0.005	0.072	0.18	1.9	0.1	0	0.39	0.054	0.064	0.21	0.66	0.46	<0.005	<0.02
C2-Chrysenes	<0.005	<0.005	<0.005	0.11	0.053	<0.005	<0.005	<0.005	1.6	<0.005	0.014	0.11	<0.005	<0.005	0.07	0.18	0.2	<0.005	<0.02
C3-Chrysenes	<0.005	<0.005	<0.005	0.052	<0.005	<0.005	<0.005	<0.005	0.87	<0.005	<0.005	<0.005	<0.005	<0.005	0.052	0.064	0.12	<0.005	<0.01
C4-Chrysenes	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.81	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.02
Benzo(b)fluoranthene	0.12	<0.005	0.075	0.29	0.35	0.018	0.13	0.37	1.7	0.18	0.19	0.8	0.069	0.12	0.58	1.8	0.92	<0.005	<0.02
Benzo(k)fluoranthene	0.11	0.44	0.064	0.25	0.32	0.017	0.098	0.32	1.2	0.16	0.17	0.69	0.059	0.11	0.39	1.4	0.67	<0.005	<0.02
Benzo(a)pyrene	0.2	0.59	0.053	0.48	0.56	0.018	0.18	0.55	2.7	0.32	0.29	1.3	0.1	0.19	0.66	3.1	1.4	<0.005	<0.02
Indeno(1,2,3-cd)pyrene	0.17	0.49	0.080	0.36	0.49	0.031	0.15	0.54	1.8	0.24	0.23	1.1	0.086	0.15	0.55	2.5	1.4	<0.005	<0.02
Dibenz(a,h)anthracene	0.022	0.069	0.012	0.046	0.057	0.006	0.019	0.063	0.25	0.028	0.029	0.13	0.011	0.018	0.085	0.26	0.11	<0.005	<0.02
Benzo(g,h,i)perylene	0.12	0.3	0.049	0.27	0.4	0.032	0.11	0.38	1.3	0.18	0.16	0.81	0.064	0.11	0.35	1.6	1.1	<0.005	<0.02
Total Metals (mg/Kg dry wt.)																			
Antimony	<10	10	<10	10	<10	10	<10	10	10	<10	10	10	<10	<10	<10	10	<10	10	
Arsenic	3	4	3	4	3	7	3	5	7	3	3	4	5	2	6	5	5	1	
Beryllium	<1	<1	1	1	1	1	1	<1	1	1	1	1	1	1	1	1	1	1	—
Cadmium	1	1	1	<1	1	1	1	1	<1	1	1	<1	1	1	1	1	1	1	
Chromium	31	15	8	29	25	18	27	22	16	28	30	26	30	28	62	41	34	<1	
Copper	41	131	38	44	35	85	42	29	58	36	36	38	42	37	23	70	46	<1	
Lead	11	21	14	22	17	35	11	12	73	9	13	19	12	9	26	24	11	1	
Mercury	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	—
Nickel	30	18	12	24	22	24	27	20	24	26	29	22	27	29	17	17	11	10	
Selenium	1	1	1	1	1	1	1	1	1	<1	<1	<1	<1	1	<1	1	1	1	
Silver	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Thallium	<1	1	1	<1	<1	<1	<1	1	1	1	<1	1	1	1	1	<1	1	1	
Zinc	95	101	83	120	87	116	81	85	483	83	96	100	88	84	170	164	118	<2	



Map Source: METRO (City of Portland), 1997

Portland Harbor Sediment Investigation Portland, Oregon

Surface and Subsurface Sediment Sampling Locations Between RM 5.0 and RM 6.0

EXPLANATION:

Stations

- ▲ Surface and subsurface sediments sampling location
- Surface sediment sampling location
- -C Indicates core sample could not be co-located with surface sediment sampling location due to subsurface obstruction and/or insufficient recovery.

Note: SD-064 was not collected due to insufficient recovery.

N

500 0 500 1000 Feet

WESTON

Figure

3-2

98-0067 APR

EPA PROPOSES SIGNIFICANT BOOST TO SUPERFUND CLEANUP ENFORCEMENT

From *Inside EPA*, May 9, 2003

PITTSBURGH—EPA is proposing to significantly raise its long-standing goal of forcing industry and other liable parties to pay for 70 percent of Superfund site cleanups, by boosting the target to 90 percent of all clean-ups. The move is aimed at conserving dwindling monies in the Superfund trust fund and limited congressional appropriations.

While some industry officials say increased enforcement will provide greater fairness at cleanups, others fear it will perpetuate a long-standing trend of forcing so-called deep pocket parties to cover costs that should be borne by other parties.

According to the agency's draft strategic plan for the next five fiscal years, "through 2008, EPA will reach a settlement or take an enforcement action by the time of the Remedial Action (RA) start at 90 [percent] of Superfund sites (with RA starts during the fiscal year) that have known non-Federal, viable, liable parties."

This goal comes under the "maximize potential responsible party participation" section of EPA's draft strategic plan for fiscal years 2003-2008.

The plan is required under the Government Performance & Results Act (GPRA), the federal law requiring agencies to set performance goals and report to Congress as part of their budget cycle on their success in attaining them. The strategic plan is critical because it is used to satisfy GPRA reporting and budget planning obligations, and could determine program funding in future years.

According to the document, the purpose of this goal is to "conserve Superfund trust resources by ensuring that potentially responsible parties conduct or pay for Superfund cleanups whenever possible."

Mike Cook, director of the agency's Office of Emergency and Remedial Response, argued during at May 6 session of EPA's 2003 National Site Assessment Symposium here that increased enforcement is needed to allow the agency to handle more Superfund sites with fewer dollars available.

Cook says that there are insufficient funds available for the Superfund program and the situation will only get worse in the future. "Without a substantial increase in the Superfund budget, there will be a significant number of sites where EPA will not be able to start" remedial activities "and the number will go up next year." Cook added that the argument Superfund opponents make that the most contaminated sites have already been cleaned up is a "myth."

EPA is also seeking to require that liable parties be involved before the cleanup takes place, including at the remedial investigation/feasibility study phase, to further limit the use of Superfund dollars up front and the need to then recover these costs, an EPA source explains. More money invested earlier to find liable parties will save EPA money later, the source says.

Industry sources [sic] initial response to the proposed measure are mixed. One industry source says the proposal is "good news" for PRPs at multi-party sites because it shows that EPA is making more of an effort to get all parties involved in negotiations early. Such an arrangement "makes the distribution fairer" amongst the PRPs because a single party is less likely to be stuck with all the costs at the site.

But another industry source says the measurement may be unfair if the agency tries to implement it by only going after the "deep pockets." In order for this approach to be equitable, EPA must "go after all the parties" at a site, the source says.

Meanwhile, Cook also says that as cleanup actions reach completion at more sites, states' responsibility for post-closure actions becomes more important. The cost of these post-closure actions—including monitoring and other activities—can take funds away from cleanup activities at other sites, Cook adds, so a plan to ensure that states take care of post-closure costs is necessary.

To resolve this issue, the agency is working with representatives from the Environmental Council of the States and the Association of State & Territorial Solid Waste Management Officials on a plan to ensure that state and local governments take care of these responsibilities, which include land use controls and operation and maintenance costs, Cook says.

UAO Language

[Note: This straw proposal is modeled after EPA Guidance Memos and sample orders].

Certified Mail
Return Receipt Requested

United State Environmental Protection Agency

In the matter of: (*name company*)	)	
	)	
Respondents,	)	
	)	Docket No._______
Proceeding Under Section 106(a) of the	)	
Comprehensive Environmental	)	
Response Compensation and Liability	)	
Act of 1980	)	
(42 USC §9606(a))	)	

ADMINISTRATIVE ORDER

1. The following order is issued on this date to (*name and address of company, plus facility name or place of business if respondent is not the owner/operator*), Respondent, pursuant to §106(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) (42 USC §9606(a)), by authority delegated to the undersigned by the Administrator of the United States Environmental Protection Agency (EPA). Notice of the issuance of this Order has heretofore been given to the State of Oregon.

2. There is an imminent and substantial endangerment to the public health and welfare and the environment due to a (*threat of release, or release*) of hazardous substances as defined in §101(14) of CERCLA (42 USC §9601(14)), at the following site: the areal extent of contamination, and all suitable areas in proximity to the contamination necessary for implementation of response action, at, from, and to the Portland Harbor Superfund Site Assessment Area from approximately River Mile (RM) 3.5 to RM 9.2 (Assessment Area), including uplands portions of the Site that contain sources of contamination to the sediments at, on or within the Willamette River, as defined in the attached Portland Harbor RI/FS AOC (U.S. EPA Docket Number CERCLA-10-2001-0240) issued September 29, 2001 (the "Harbor-wide AOC").

3. This order directs you to undertake action to protect the public and the environment from this endangerment.

FINDINGS OF FACT

EPA makes the following Findings of Fact:

1. Based on site assessment activities conducted by EPA and the Respondents under the Harbor-wide AOC in the Assessment Area, contaminants found in the Assessment Area include, but are not limited to, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzo-dioxins and furans (PCDD/PCDF), total petroleum hydrocarbons (TPHs), semi-volatile organic compounds (SVOCs), dichloro-diphenyl-trichloroethane (DDT) and other pesticides, herbicides, tributyl tin, mercury and other metals, and phthalates.

2. The Site has been listed on the National Priorities List, pursuant to Section 105 of CERCLA, 42 USC § 9605, at 65 Fed. Reg. 75179-01, Dec. 1, 2000.

3. Respondent, (*is now, since ______/ was, from ______, until ______*) the (*owner/operator*) of (*list the name, and describe the nature of the owner/operator's connection to the harbor-wide facility*), within the Site. During (*this/that*) time hazardous substances, including those described herein, were released at the Site.

CONCLUSIONS OF LAW

EPA makes the following Conclusions of Law:

1. The Site is a "facility" as defined in Section 101(9) of CERCLA, 42 USC § 9601(9), and includes onshore facilities, offshore facilities, and inland waters of the United States and navigable waters, as defined in Sections 311(a)(10),(11) and (16) of CWQ, 33 USC § 1321(a), and Sections 1001(24) and (21) of OPA, 33 USC § 2701(21) and (24).

2. Wastes and constituents thereof at the Site, as identified in the preceding Section, are "hazardous substances" as defined in Section 101(14) of CERCLA, 42 USC § 9601(14), or constitute "any pollutant or contaminant" that may present an imminent and substantial danger to public health or welfare under Section 104(a)(1) of CERCLA, 42 USC § 9604(a)(1). TPHs at the Site, as identified in the preceding Section, are from discharges of oil, as defined in Sections 311(a)(1) and (2) of CWQ, 33 USC § 1321(a)(1) and (2), and Sections 1001(23) and (7) of OPA, 33 USC § 2701(23) and (7).

3. The presence of hazardous substances at the Site or the past, present, or potential migration of hazardous substances currently located at or emanating from the Site, constitute actual and/or threatened "releases" as defined in Section 101(22) of CERCLA, 42 USC § 9601(22). The presence of actual or threatened discharges of oil

at the Site from vessels and/or facilities in violation of Section 311(b) of CWA, 33 USC § 1321(b), may be an imminent and substantial threat to the public health or

welfare of the United States, including fish, shellfish, wildlife, public and private property, shoreline, beaches, habitat, and/or other living and nonliving natural resources under the jurisdiction or control of the United States.

4. Respondent is a "person" as defined in Section 101(21) of CERCLA, 42 USC § 9601(21), and/or Section 311(a)(7) of CWA, 22 USC § 1321(a)(7), and Section 1001(27) of OPA, 33 USC § 2701(27).

5. Respondent is a responsible party under Sections 104, 106, 107 and 122 of CERCLA, 42 USC § § 9604, 9606, 9607, and 9622.

6. The actions required by this Order are necessary to protect the public health and welfare and the environment, are in the public interest, are consistent with CERCLA and the NCP, 42 USC § § 9604(a)(1), will expedite effective remedial action and minimize litigation, 42 USC § 9622(a), and are consistent with Section 311 of CWA, OPA and regulations thereunder.

ORDER

Based upon the foregoing determinations and findings of fact, it is hereby ordered and directed that:

1. Respondent coordinate and cooperate with Respondents to the attached Harbor-wide AOC, as if Respondent herein were a Respondent to the attached AOC, and comply with and be subject to the terms of said attached AOC in the same manner and to the same extent as the captioned Respondents thereto.

2. All actions and activities carried out by Respondents pursuant to this Order shall be performed in accordance with all applicable Federal and State laws, and applicable EPA regulations, requirements, and guidance documents, and applicable amendments to them.

EFFECT OF ORDER

1. This order is not, and shall not be construed to be, a permit issued pursuant to any federal, state or local statute, regulation or ordinance.

2. Nothing in this Order shall constitute or be construed as a release from any claim, cause of action, or demand in law or equity against any person, firm, partnership, or corporation not bound by this Order for any liability it may have arising out of or

relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any waste materials found at, taken to, or taken from the Site.

3. Nothing herein shall constitute or be construed as a satisfaction or release from liability of Respondents or any other person.
4. Invalidation of any provision or requirement of this Order shall not affect the validity of any other provision or requirement of this Order.

EFFECTIVE DATE-OPPORTUNITY TO CONFER

1. This order is effective on the twentieth calendar day following receipt thereof by Respondent, and all times for performance of response activities shall be calculated from that date.
2. Within ten calendar days of receipt of this Order you may request in writing a conference with Chip Humphrey to discuss this Order and its applicability to you.
3. At any conference held pursuant to your request, you may appear in person and by attorney or other representatives for the purpose of presenting any objections, defenses or contentions which you may have regarding this Order. If you desire such a conference, please contact Chip Humphrey, Remedial Project Manager, EPA, Region 10, 1200 Sixth Ave., Seattle, WA 98101, within ten calendar days to request a conference.

PENALTIES FOR NON-COMPLIANCE

Respondent is advised that willful violation or failure or refusal to comply with this Order, or any portion thereof, may subject Respondent to a civil penalty of not more than $5000 for each day in which the violation occurs or failure to comply continues, under §106(b) of CERCLA (42 USC §9606(b)). Failure to comply with this order, or any portion thereof, without sufficient cause, may subject you to liability for punitive damages in an amount up to three times the amount of any costs incurred by the government as a result of your failure to take proper action, under §107(c)(2) (42 USC §9607(c)(2)).

TERMINATION AND SATISFACTION

1. This Order shall terminate when Respondent demonstrates and certifies to the satisfaction of EPA that all activities required under this Consent Order, as amended by any modifications, including any additional work, payment of oversight costs, and any stipulated penalties demanded by EPA, have been performed and EPA has approved the certification.

2. The certification shall be signed by a responsible official representing Respondent. The responsible official shall make the following statement following attestation: "I certify under penalty of perjury under the laws of the United States, that the information contained in or accompanying this certification is true, accurate, and complete."

Issued this _______ day of ________, 2003
U.S. EPA, Region X, Office of Environmental Cleanup

BY: ______________________________ DATE: ________
XX, Director